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The NEW ZEALAND JOURNAL OF AGRICULTURE

Vol. 67. WELLINGTON, SEPTEMBER 15, 1943. No. 3.

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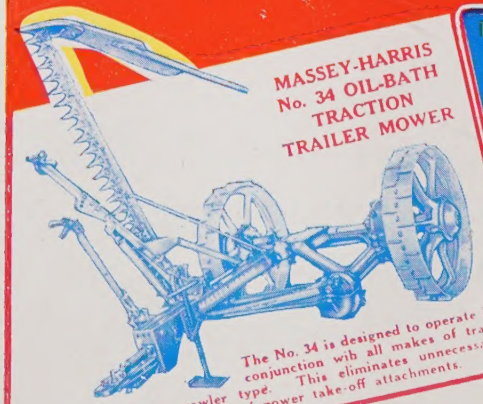

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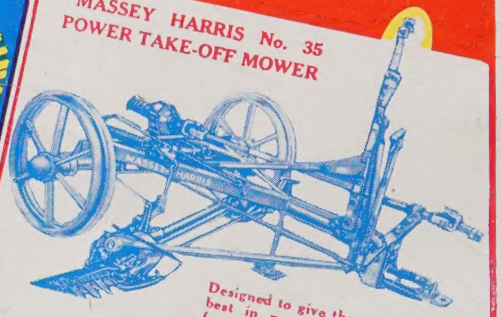

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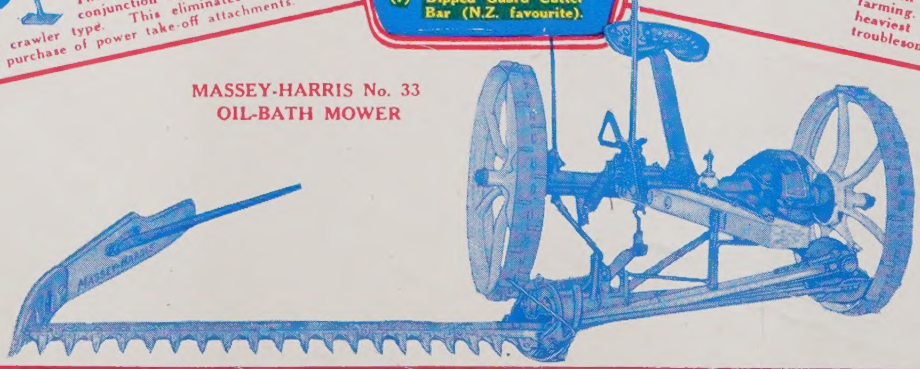

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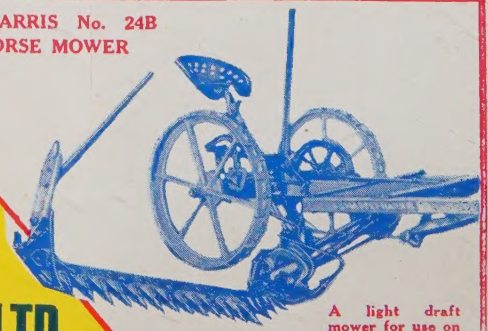

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THE NEW ZEALAND
JOURNAL OF AGRICULTURE

Vol. 67. No. 3.
Sept. 15, 1943.
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Published by direction of Hon. J. G. Barclay, Minister of Agriculture.

Following the article in the April 1943 issue of this Journal, fuller details are given here of improved methods for treating milking-machine rubberware. These are based on investigations carried out by the author in collaboration with Messrs. W. G. Whittleston and K. J. McNaught of the Animal Research Division. Teat-cup inflations have been found to absorb large quantities of butterfat and the method described for removing this has recently been demonstrated by the author to meetings of Farm Dairy Instructors.

Milking-Machine Rubberware

— By —

G. M. MOIR, M.Sc., Ph.D., A.I.C.,
Dairy Chemist, Dairy Division's Laboratory, Wallaceville.

New Methods For Conservation

NEVER before has it been so important to have milking machines and rubberware properly cleaned. The people in Britain who buy our butter and cheese receive very limited rations, and we have a duty to see that our produce is of the best quality. That cannot be achieved if the milking equipment is not properly cleaned. Again, dirty rubberware perishes quickly, and as supplies are so very limited, special efforts must be made by thorough cleaning to make the rubber parts of milking machines last as long as possible. Dirt on rubberware is of two kinds. Firstly, that which adheres to the surface of the rubber. Such dirt includes milk residues, fat, teat salves, and a variety of filth, and in it millions of germs live and multiply so as to contaminate any milk which touches it. Such dirt often lodges in cracks which have developed about the mouth of the inflations, both inside and out. Even if the film of dirt is so thin as to be almost invisible it can damage both the milk and the rubber. Secondly, recent laboratory work has demonstrated the importance of fat absorption by rubberware.

Fat Absorption

Butterfat is readily absorbed by rubber, especially by the inflations. For a period of from two to four hours daily these are applied to the cow's teats. A film of milk gathers between the teats and the rubber, and some of the fat in this milk is gradually worked into the rubber by the vigorous squeezing which is going on all the time. As the flow of milk falls off, the strippings become richer in fat, which is thus even more readily taken up by the rubber. By contrast, the hot caustic soda solution used for cleaning is in contact with the rubber for only two or three minutes daily. This will remove the last traces of fat and milk left on the **surface** of the rubber but it will not touch the fat which has worked into the pores of the inflations during milking. This fat causes the inflations to swell and lose their elasticity so that they become too slack to milk efficiently. More than that, the fat is capable of causing the rubber to perish more rapidly, especially where it is stretched by the ring at the mouth of the teat-cups. This perishing is still further accelerated if bright light shines on the rubber. All these three factors, absorbed fat, stretching, and light, operate together on the rubber at the mouth of the teat-cups. This part of an inflation therefore perishes most rapidly, and soon develops tiny surface cracks. In these cracks more fat and dirt can lodge and speed up the damage, especially if boiling water and caustic soda are not used twice daily.

Laboratory tests show that discarded inflations usually contain at least 10 per cent. by weight of butter-fat, and in a few cases over 40 per cent. has been extracted. These figures are based on the whole inflation, but as the fat is not distributed uniformly, certain parts commonly contain as much as 30 per cent. of fat.

MORE "WONDER" RECORDS!

Three outstanding cows (left) in the well known herd of MR. O. R. SELF, Papatoetoe. "WONDER" MINERAL STOCK FOOD is used extensively and regularly.

(Right) — Winning open Southdown Group exhibited by MR. SELF at the Hamilton Show, 1939. Here again "WONDER" plays its part in maintaining the health and stamina of the flock.

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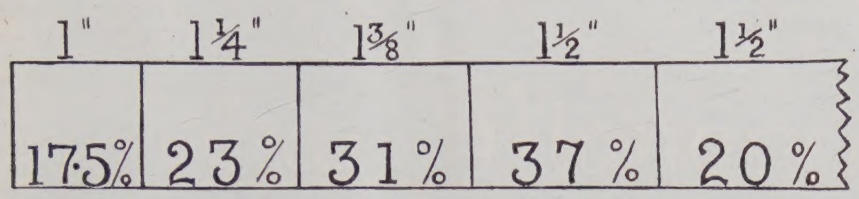
The accompanying diagram shows the percentages of fat found by laboratory analyses of the different portions (lengths in inches) of an inflation discarded after three months' use. It



was washed with washing soda and ample boiling water once daily and after about six weeks use was removed from the teat-cup, shortened at one end, and reversed. If inflations which have been long in use are warmed in front of a fire traces of fat may be wiped off the outside surface. To extract the fat from inflations they must be removed from the teat-cups to be treated with a hot solution of strong caustic soda in the following manner:—

Butterfat Removal

TO REMOVE BUTTERFAT FROM INFLATIONS, prolonged treatment is necessary with a strong, hot solution of caustic soda. This will corrode most metal vessels, especially tin or aluminium, and a copper vessel is not recommended, but a large, old-fashioned iron pot, like those formerly in common use, will do very well. When the pot is heated, rubber in contact with the bottom may be damaged, so a mat of folded wire-netting should be put in underneath the inflations. Caustic soda is added in the proportions given below. Alternatively, it is possible to use the ordinary tall quart preserving jars which are usually available in a farmhouse kitchen. Half fill each jar with warm (not hot) water, and if possible put in **first** one teaspoonful of metasilicate of soda, or alternatively one of a soda mixture as specified later (or a tablespoonful of washing soda). Then add four heaped teaspoonfuls of caustic soda, using one inflation to stir up and dissolve each teaspoonful of caustic before adding the next. The rest of the inflations are then put in, and the jar filled wtih more warm water. Several jars may be stood in a half-kerosene-tin or in a pot (not aluminium which the caustic will corrode and spoil).

When the tin or pot is heated, the bottom of a glass jar will crack readily if it is in direct contact with the metal, so a block of wood or a piece of wire-netting folded double should be placed under the jars in the tin before filling it up with warm (not hot) water. This may then be placed on the kitchen stove and allowed to warm up slowly, to be as hot as possible without boiling (temperature 190-200 degrees Fahrenheit). More warm water should be added when required. If the inflations are too long for the jar they may be lifted out later with a piece of wire and the top end turned to the bottom, taking care to avoid splashing the strong caustic solution; any which comes in contact with the skin should be rinsed off at once.

The longer the inflations have been in use the longer they will require to be in the hot solution. After three to five hours they may be removed and rinsed several times in very hot water, brushing to remove any dirt loosened by the soaking, especially near the ends. After this treatment they may be replaced in the teat-cups, turning them end for end if possible. If the inflations have been long in use, a second treatment with caustic solution may be needed to remove all the fat, but if the treatment can be applied at intervals of two or three weeks a weaker caustic solution (two teaspoonfuls) may be used.

BUTTERFAT SOAP is produced by the action of the caustic upon the fat extracted from the inflations. If the solution left after the treatment is allowed to cool overnight, dirt removed from the inflations settles to the bottom while a surprising amount of butterfat soap solidifies as a thick jelly. This can be separated by pouring through a piece of cheese cloth, and the clear solution may be diluted and used for washing the machines.

WARNING—This strong caustic solution, especially when hot, is very corrosive, and must be kept out of reach of children, and also of farm animals, lest they happen to drink it when it is cold. It must also be kept away from tin-ware and especially from aluminium utensils.

Shortage of labour is frequently given as the excuse for inadequate cleaning, but if the proper methods are adopted the cleaning can be completed in about twenty minutes after each milking finishes. Some farmers spend much longer than this without getting satisfactory results because they do not use the best methods. These are described in the Department of Agriculture's Bulletin No. 118, 'Cleaning of Milking Machines," which the following notes are intended to supplement.

Notwithstanding certain disadvantages a hot caustic soda solution has several important advantages:—

(a) It dissolves casein and milk residue very easily.

(b) It converts butterfat into soap.

(c) It is a very powerful germ-killing agent.

If left open to the air caustic soda quickly absorbs water and carbon dioxide and loses its strength, so that the small amount recommended for washing milking-machines will not be effective. For this reason it must be kept in a tin with the lid on.

NOTE.—Keep the tin in a safe place with the **lid on tight** lest a child reach it to play with or drink the contents after they are liquefied by absorbing water. Before discarding an empty tin swill it out with boiling water.

Many farmers are afraid to use caustic soda on account of its dangerous and corrosive properties so they use washing soda, but as that is so much weaker it will give satisfactory results only if plenty is used, a large handful per four-gallon bucket. Washing soda is **nearly-two-thirds water,** and farmers who are reluctant to use caustic would be better to use one of a certain class of soda mixtures sold by dairy supply firms. These consist largely of soda ash (which is washing soda without its water), together with 15-25 per cent. of metasilicate of soda (and also some tri-sodium phosphate when that is available). These added soda compounds have very valuable cleansing and water-softening properties, which enable particles of fat and dirt to be easily rinsed off the equipment. Such soda mixtures tend to become lumpy so they should be broken up if necessary before use. The soda should be added to the water, not the other way round, and about one heaped teaspoonful per gallon is required.

Pure metasilicate of soda is sold under various trade names, but it is not recommended for use by itself for daily washing purposes. A variety of

soda mixtures are marketed by different firms and the class recommended above should be distinguished from two other classes. One of these contains considerable amounts of baking soda, and such mixtures are not powerful enough to be satisfactory for washing milking machines. The other class contains a proportion of caustic soda and is prepared for factory cleaning purposes rather than for use on dairy farms. Anyone who is in doubt about suitable soda mixtures is recommended to ask his Farm Dairy Instructor for advice about various brands which are available.

Important Points

1. Liberal rinsing with cold water is essential **before** applying boiling water and soda. It is hardly possible to use too much cold water, especially for rinsing bulky equipment such as the cooler and the inside of the releaser, to check the development of milkstone.

2. The outside of the teat-cups and claw, etc., should be thoroughly washed with warm water and soda mixture, and brushed if necessary, **before** the boiling water and caustic soda is put through.

3. Caustic soda is definitely preferable to washing soda, using at least one heaped teaspoonful per four gallons of boiling water.

4. In order to maintain the full strength of the caustic and to get still better results, especially if the water supply is hard or acid, add to the boiling water at least one heaped teaspoonful per four gallons of one of the soda mixtures specified above. This must be done **before** adding the caustic. A combination of this kind is preferable to the use of several times as much caustic.

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5. Treatment with boiling water and caustic should be carried out **twice** daily, and the water must be BOILING.

Special Care

1. On account of the damage done to rubber by sunlight, the teat-cups, claw, and long rubbers should not be put out in the sun to dry or air off, but should be kept in a dark spot. In many milking sheds at certain seasons the sun shines directly on the rubberware, or sunlight may be reflected on it from the concrete floor for several hours daily. If racks were provided in a dark corner on which the teat-cups, etc., could be hung up, damage due to bright light could be checked.

2. Swelling and slackness of the inflations are due to the absorption not only of butterfat, but also of vaseline or teat-salves. Thes substances are even more difficult than butterfat to remove from rubberware so they should be sparingly applied to the teats **after** milking, not before. Sticky deposits on claw tubes are often due to careless use of too much vaseline.

3. Notwithstanding regular daily cleansing, films of dirt may accumulate on rubber surfaces, especially on claw tubes or about the **mouth** of inflations, which perish rapidly when allowed to become dirty. To clean the rubberware, it should be detached from the machine and soaked for several hours in a hot solution of metasilicate of soda, strength about 1 per cent., which is one heaped teaspoonful per quart. Instead of metasilicate, one of the soda mixtures specified above will do, but caustic soda should not be used in metal containers for this purpose as it will remove the tinning. If a copper vessel is used, care should be taken to keep the metal from touching the rubber on which copper will form black deposits and spoil the rubber. If the solution is kept hot while soaking, the dirt will be removed more easily later when scrubbed with a small scrubbing brush or finger-nail brush, dipped into the hot soda solution. This treatment will remove surface dirt, but will not touch fat nor vaseline which has soaked into inflations. It is very good for cleaning up claw tubes and the long milk and air rubbers. If used at frequent intervals, it will keep heavy moulded inflations in better condition.

Longer Life

The treatment described earlier with a hot solution of strong caustic soda should not be regarded as superseding the twice-daily use of the boiling water-and-caustic soda method recommended in Bulletin No. 118. It may be tried out to begin with on soft inflations which have been discarded as too slack to milk efficiently. Trials with such inflations treated at Wallaceville have shown that they can be used again for several weeks longer. To identify treated inflations before replacing them in the teat cups an ink pencil can be applied to the slightly damped surface of the rubber to mark it with large numbers or letters.

This fat-removal treatment is specially recommended for use at weekly or fortnightly intervals on new soft inflations. These should be turned end for end when being replaced in the teat-cups, and this can be done easily, even with plug-type cups, the inflations from which usually do not behave well when reversed. Trimming the ends of stretched inflations to shorten them may also be avoided. Every farmer knows that with new inflations he gets quicker milking and less strippings. By the treatment suggested, the new condition of the inflations may be maintained for a longer time. In addition better-quality milk or cream will result from the removal of contaminating material present in apparently clean rubberware.

Centenary of Well Known Sheep Dip Firm

The firm of Cooper, McDougall & Robertson, Ltd., Sheep Dip and Animal Remedy Manufacturers, with its head office at Berkhamstead, England, and branches throughout the world, recently passed its hundredth milestone. The name of Cooper is now a household word amongst the farming community of all nations.

From a very small beginning 100 years ago this Company has expanded and extended its trade to every sheep breeding country throughout the world. But for the incidence of war, this great centenary event in the history of the firm would have been widely celebrated, but the demands of the nation's very existence come first, so that all such celebrations must be postponed until peace once more prevails.

To continue to prosper and expand over such a great period as 100 years, provides ample proof of the service rendered by the firm to the farming community, by producing products of sterling merit and quality, so that it can be truly said it has lived up to its motto of "I undertake and I perform." It is the firm's intention to continue to provide this service to the farming community in the years to come, and it takes this opportunity of thanking patrons in New Zealand and throughout the world for their loyal support.— P.B.A.

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Weaner Pigs— Why Do They Wilt?

— By —

H. R. DENIZE,
Principal Inspector,
Livestock Division, Wellington

THE minor common ailments of both the human and the animal kingdom that are continually occurring, are generally due to neglect on the part of the individual or owner, who takes a risk, hopes for the best, and when the worst happens, calls in the doctor or the veterinary surgeon too late.

Because the treatment advised fails to restore health, the reputation of the expert suffers, and sickness tends to be enshrouded in mystery. The greatest mystery about stock ailments is that owners persist, year after year, in subjecting their animals to conditions of exposure to the weather, and of insufficient and unsuitable food, too severe for the natural resistance of the animal.

The root of most stock ailments is the practice widely prevalent in New Zealand of feeding animals only in the productive season and letting them take their chance at other times of the year. It is evident with dairy cows too often left to fend for themselves when not in milk, with sheep similarly, and with pigs notoriously from weaning until they have grown sufficiently to fatten, that is provided they haven't died in the meantime.

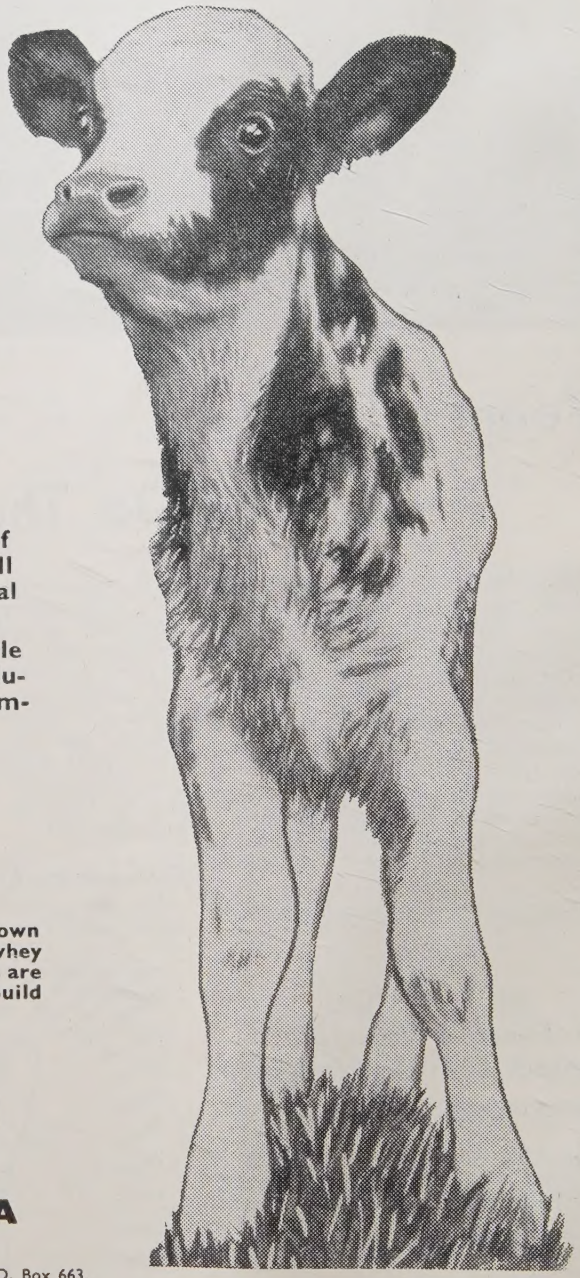
Common sense, plus good observation, is the chief attribute of the stock-raiser, who keeps his stock healthy and well. This common sense has not been sufficiently encouraged by writers and advisers, who, in playing up to the mystery associated with disease often talk glibly about vitamins, minerals, proteins, carbohydrates, balanced rations, and the like, so creating in the owner's mind a state of helplessness that results in leaving his animals to fend for themselves and take their chances.

Pre-weaning Treatment

At weaning time pigs are still babies. and require careful attention for 4 to 6 weeks after weaning; or until they attain the live weight of 70lb. They are easily upset by change of diet or housing, and to avoid this it is necessary to get them gradually accustomed as suckers to the diet they will live on after weaning. While they are still on the sow start them feeding in a creep at 3 weeks old, and get them eating up to half a pound of meat-meal by the time they are 8 to 10 weeks old, gradually increasing the amount from the beginning, with no sudden change. In England it is an eastern county saying "that pigs wean themselves with peas and contentment," and they pay good dividends when they are eating sufficient from the trough at weaning time not to miss their mother's milk.

A severe check due to a change in the quality of the feed or to a change of housing at this critical period of the pig's life lowers its vitality and powers of resistance, and renders it

"My Boss Says it's MOOSE for me!"



The calves of today are the profit producers of tomorrow. Wise feeding at the outset will ensure that future health and stamina so essential for maximum butterfat production.

For the first week or two they should get whole milk, preferably their mother's, and then gradually changed over to MOOSE porridge with skim-milk or whey.

MOOSE MEAL

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A COMPLETE RATION

Skim-milk or whey fed alone cannot produce well-grown healthy yearlings, because skim and whey lack *fat* and whey needs added *protein*. These very necessary constituents are provided by adding MOOSE MEAL to the daily diet. Build tomorrow's herd today.

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for **HEALTH**
for **STAMINA**

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a ready subject for troubles such as pleurisy, tuberculosis, diarrhoea, worms, constipation, and other ailments, which, although not readily discernible from outward appearance, show up prominently afterwards, and may render the carcase unexportable, or even unfit for human consumption.

Skim-milk, when supplemented with half a pound of meat-meal per pig daily, gives excellent results. If 30lb. of meat-meal were fed to every pig in New Zealand before it attained the age of 14 weeks, there would be no sick stores and a very considerable reduction in pleurisy and allied complaints. Observant farmers have remarked that prior to the introduction of the bobby calf trade, when calves were slaughtered, boiled down, and fed to the pigs on the farm in conjunction with dairy by-products or home-grown feeds, there was little difficulty with the weaner-four months stage. In many places pigs are still fed on boiled animal refuse from country slaughter-houses, and where this happens sick pigs are rare or unknown.

Many get excellent results by feeding cod-liver oil to pigs, a teaspoonful daily per piglet, mixed with the meal ration in the creep, for 10 days before weaning, and increased to a tablespoonful daily per pig after weaning. While the use of cod-liver oil has often to be recommended, in order to correct the abuse or neglect that is already showing itself in the form of unthrifty pigs, it is only a makeshift that cannot satisfactorily replace the sounder practice of using meat-meal to prevent trouble. Prevention is better than cure; 3s 6d for 30lb. of feed, as meat-meal, is a better buy than 1s 6d for a pint of cod-liver oil, equivalent to 2½lb. of feed. Even though the latter is packed with vitamins the pig can never make a pint of cod-liver oil into 8 to 10lb. of carcase, but he has little difficulty in doing this with 30lb. of meat-meal.

In addition to their half a pound of meat-meal, plus milk or other home-grown feed, pigs are insured against mineral deficiency by having access to charcoal, slack-coal, or any of the recognised mineral mixtures. A home-made mixture of one part of salt and five of ordinary carbonate of lime is just about as useful as any other mixture. Pigs can have free access to this, or it can be fed at the rate of half an ounce to one ounce per pig per day.

Good Housing Helps

A warm, dry shelter, with well-drained, clean surroundings is the other positive change that would be the means of avoiding much of the pleurisy that is now encountered. Money spent on sties and accommodation is the best investment on a pig-farm, especially if it has the effect of making the owner proud of his pigs; then they will get the attention that enables them to pay dividends.

Where only a few pigs are kept there is not the need for this attention, because the diversity of feed supply and the quantity provided are usually sufficient to maintain the pig in health. Where many are kept, care and close observation are necessary, since a man is often obliged to do his pigs fairly hard and depends a good deal on their ability to withstand hardship. There is still a wide margin between doing pigs hard and abusing them, and it is easier to prevent sickness than to cure it. Time spent in planning to keep pigs fit is more profitably spent than it is in digging holes to bury them.

The National Pig Industry Council fully appreciates the importance of the pig industry to this Dominion, and that this great potential industry could and should be considerably increased. With that object in view its officers are working in close co-operation with the Department of Agriculture and other organisations interested in pig-raising.

This extension service is now organised on sound lines, through nine District Pig Councils, and any persons desiring information on any phase of pig-keeping should contact the nearest Stock Inspector or District Supervisor, where officers are at all times willing to assist farmers.

Farmers are entitled to the assistance and advice of the District Pig Council Supervisors. Pig producers have provided the funds to enable these Councils to be set up, and all farmers are urged to take every advantage of these facilities. Applications for assistance should be made to the Department of Agriculture or to District Supervisors as follows:—Whangarei (Box 131); Pukekohe (Box 32); Whakatane (Box 12); Gisborne (Box 316); New Plymouth (Box 131); Palmerston North (Box 80); Dunedin (Box 693); Christchurch (Box 639); Hamilton, care Department of Agriculture.

Modern Piggeries.

Better housing, sanitation, and facilities for looking after pigs are among the first improvements that are made with profit on most farms where pigs are kept. Plans and specifications of houses and layouts actually in use in New Zealand are available in the Department's **free** bulletin, "Layout and Construction of Modern Piggeries." Copies may be obtained from the Department of Agriculture, Auckland, Wellington, Christchurch or Dunedin.

Building Materials for Piggeries

PIG-KEEPERS, like many other primary producers, are still experiencing difficulty in obtaining the necessary building materials and equipment to enable them to expand and improve their pig plants.

The Commissioner of Works has indicated that instructions will be issued concerning the release of available supplies of timber, roofing, cement, piping and wire-netting, which it is hoped will speed up the release of these materials.

Accordingly, pig-keepers are requested to send to the Pig Council of their district a statement of the exact quantities of any such materials required. These details should be set out clearly on a separate sheet of paper, supported by an accompanying letter stating the purpose for which the materials are required, *i.e.*, a fattening house, farrowing-unit, etc., including details of size, for the accommodation of so many pigs, etc.

Such applications will be recommended, or otherwise, by the respective District Pig Council, and passed to the Building Controller for the district concerned. The latter will be responsible for the release of the materials required as soon as possible, if available supplies permit. Pig-keepers are warned that certain materials, such as piping and roofing iron, are in very short supply, and in consequence Building Controllers may be unable to give an immediate release of any such materials.

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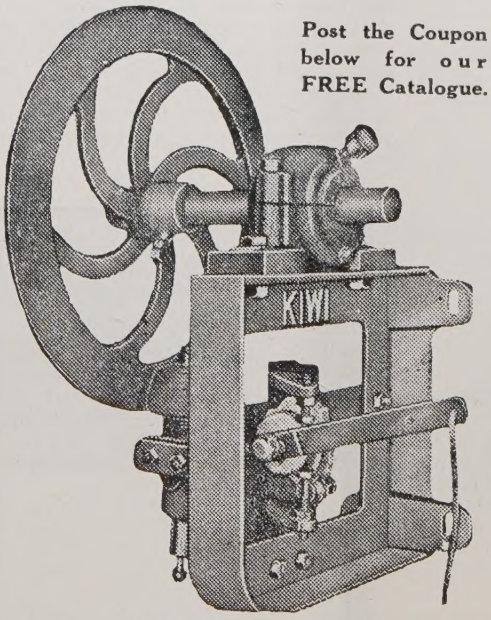

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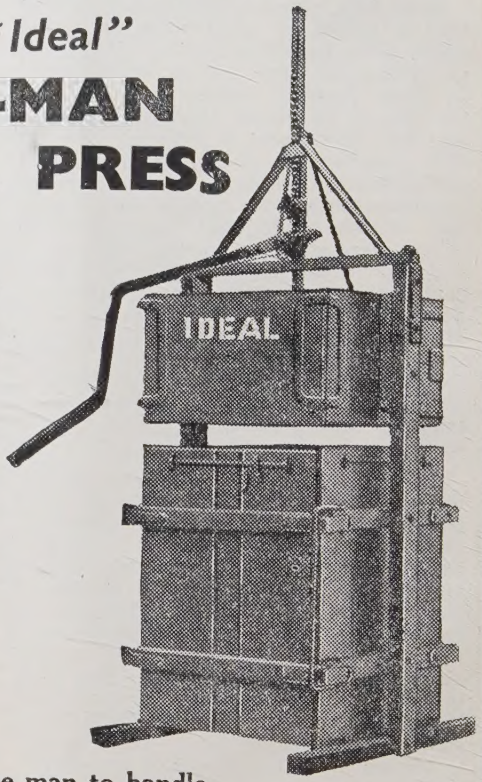

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Improvements to Pulling Machines

Linen flax growers are paid a delivery bonus commensurate with the condition of the straw at the time of carting to the factory. This bonus may be considerably increased if growers are prepared to follow the suggestions made in this article.

— By —
W. L. HARBORD,
Fields Instructor, Invercargill.

THE urgent need for a better type of sheaf to be made and delivered to the factories was stressed in an article entitled "Handling of the Linen Flax Crop" in the December, 1942, issue of this Journal. It was pointed out that many of the heavier crops when pulled resulted in sheaves being badly fanned at the ends, and very often tangled into clusters of three and four sheaves. This failing of the flax pulling machine was a very serious one, and caused much waste at the various factories throughout New Zealand.

The result of this publicity was very favourable, in that farmers in Southland particularly took a keen interest in the subject, and many of them resolved to do their utmost to make better and straighter sheaves when their crops were pulled. Several farmers actually carried out the proposals laid down in this article and straightened and separated their sheaves on the ground immediately after they had been pulled. This proved slow and arduous work, and while the benefit was indeed considerable over the old method, it was plain to see that the ideal was still to be reached.

A Farmer Thinks

One farmer, Mr. F. Ridder, of Otahuti, had actually commenced such operations when his crop was being pulled. However, realising that improvements could be made on the pulling machine, he, in conjunction with the contractor concerned, set about to try different methods of improving the sheaf on the machine. After some thought had been given to the matter, Mr. Ridder decided on working a man at the side of the puller and directly opposite the knotter. A stout piece of wood with a seat at one end was clamped underneath the drawbar in such a way that the man sitting on the seat would be close up to the knotter. The sheaf shield had previously been removed. At the same time another man sat on the drawbar in front of the knotter, and his job was to assist in the separation of sheaves as they left the knotter, and also in the holding of straws to start off each new sheaf.

Above Left.— A crop pulled with the usual method and without the extra men on the puller. Note the sheaves tangled and in clusters. *Right.*— Sheaves pulled by the improved method. No sheaf is tangled or clinging to another.

This latter part was important in that when a sheaf was started squarely into the twine it resulted in a better butted sheaf. The man at the side took the sheaves from the knotter and while holding them in his lap straightened them as best he could, and then deposited them behind the machine on the ground. To carry out this operation the travelling speed of the puller had to be considerably reduced, and also it was found that even when travelling very slowly in low gear it was necessary to take less than the

ATTACHMENTS AVAILABLE

IN THIS article Mr. Harbord describes experiments designed to improve the harvesting of flax and I welcome the opportunity of assuring the growers and instructors concerned that they are performing a very real service to the industry.

The factory endeavours to produce the maximum proportion of line fibre and the minimum of tow because the value of line fibre is so many times greater than that of tow. While it is true that a high proportion of tow may result from several causes, yet the paramount cause is the uneven butting of straw. Thus straw carefully handled and butted will yield an astonishing increase in the proportion of line fibre and a corresponding decrease in the proportion of tow. Not only this, but in every operation in the factory, evenly butted and straight straw is more easily and economically handled and greatly increases the capacity of the factory. This is particularly true when feeding the scutcher, but it applies also to deseeding, filling tanks, paddock work and in the preparation of the fibre for export.

It is therefore a matter of great satisfaction to those engaged in processing to find farmers and instructors co-operating in an effort to improve the present method of harvesting and they may be assured that in doing so they are helping very materially in the establishment of linen flax as a post-war industry.

Most of the pullers in Southland have now been fitted with the necessary attachments to permit the adoption of Mr. Harbord's recommendations. In other centres the attachment will be supplied on receipt of a request from the Instructor in Agriculture.

J. W. HADFIELD,
Director, Linen Flax Development.

ordinary pulling width. This operation did a splendid job, in that sheaves were all considerably straightened, and no sheaf was tangled with its neighbours on the ground.

One drawback, however, was the actual pulling time, and in this particular crop it took approximately 5 hours per acre with this method. Mr. Ridder's idea of pulling, while an improvement in the type of sheaf produced, would in the long run prove to be too slow an operation, but he has undoubtedly done a service to the farmers and the industry. He started the ball rolling, and other farmers, having seen the idea in operation, and having other ideas of their own, carried the improvements still further until today a big improvement has actually been obtained.

Idea Improved

The next stage was in the crop of Mr. H. I. Queale, of Lochiel. The same idea was put on the puller, and while an even lesser width of straw was actually pulled at a time, the travelling speed of the tractor was increased, and in this crop the acreage rate was lowered to a little over 3 hours.

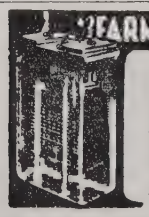
A still greater improvement was then seen in the crop of Messrs. D. Blue and MacPherson, of Waianiwa. Here a slight alteration in the original was made. The sheaf tray was put back on the machine, but was bent in such a way that only two-thirds of its area was exposed for the sheaf to fall on. This also meant that the man on the side of the machine was compelled to sit further away from the knotter. Another man was employed on the front of the machine.

The man at the side pulled the sheaf from the knotter and by turning it "end for end" allowed the head to drag for a moment on the ground while he still held the butt end. In this way the same straightening effect was obtained.

The change here on the old method was a very simple one, but the improvement was indeed great, in that the speed of the machine was increased so that the pulling time actually came down to approximately 2¼ hours per acre.

However, the trouble in this case was that the work was too strenuous for the one man on the seat, and it required relays of men. This made the contractor, Mr. F. Adams, of Lochiel, very keen, and in his next crop of 19 acres he employed two men on the side. Both were accommodated on seats in the same method as previously, one being on the side just opposite where the power shaft joins the actual machine, that is, to the side and front of the knotter. The other man was in his original place.

The front man of these two pulled the sheaf from the knotter, at the same time holding the straws in place to start off the next sheaf. On pulling it from the knotter he allowed the sheaf to fall on the sheaf tray, from where the second man took hold of it. Anyone having had any experience with these machines will realise immediately that a sheaf comes from the knotter in such a way that it has two broad sides and two narrow sides or edges. The second man on the side gripped the butt end of the sheaf by one of the edges and, turning it over, deposited it on the ground beside him, still allowing the dragging motion, mentioned previously, to straighten any fanning effect. This was indeed a big improvement. The sheaves made were better than any previously turned out. The men were able to stand up to the work even when a fast pace was put on and the actual pulling time



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Left.—In the crop of Blue & McPherson, Waianiwa. The extra man is in position and is about to grasp the butt end of the sheaf. *Right.*—After the sheaf has been turned end for end the head of the sheaf is dragged for a moment before the sheaf is released. Note the sheaf shield and how it is bent under.

in a number of crops was 2 hours per acre.

A feature of the result of this idea on the pullers is to be seen when a crop is actually stooked. One crop actually stooked up every bit as well as a crop of wheat. Sheaves were all perfect, and the paddock made a splendid picture.

Further Trials

An experiment was conducted in the crop of Mr. J. W. Paterson, of Hokonui. A heavy crop of 12 acres was divided into three 4-acre blocks. One block was pulled by the old pulling method, that is with no adaption attached to the puller. The second block was pulled with two men operating on the side of the machine, and the third was cut with the binder.

The first block with the ordinary puller took 9 hours to pull, one man taking 19 hours to stook it. The second block with the latest adaption on the machine was pulled in 15 hours and took one man 14 hours to stook. The last and third block of 4 acres was cut with a 6-foot power binder with an improvised shedder attached. This took 6½ hours to cut and one man stooked the area in 15 hours.

While Mr. Paterson's crop was even throughout, the plants were very coarse with excessively long and tangled seed heads. It was a long crop, making it hard for the men to handle the sheaves satisfactorily. Also these men on the side were new to the job and had to learn the method of handling as they proceeded with the work. As a result the difference in pulling times was not as satisfactory as was expected, for it was already realised that in a crop more adaptable to the new method than Mr. Paterson's very little difference in pulling times would have resulted.

As an instance of this the pulling time on the 19-acre crop of Messrs. Burnett Clark and Jackman, of Dunearn, estimated at over 3 tons per acre, when pulled with the new method, was 38 hours. On such a crop the same number of hours would be considered satisfactory for the ordinary pulling method, but the stooking after the new pulling method would take considerably less hours than after the old method. Mr. Clark, of Messrs. Burnett Clark and Jackman, was very pleased with the pulling of his crop and stated that he considers the stooking time was approximately half what

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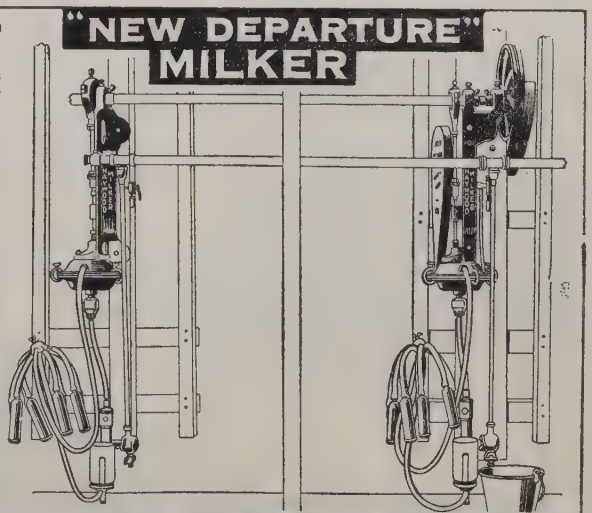

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it would have been had the ordinary puller harvested the area. In the 1941-42 season Mr. Clark had a heavy crop which came off the puller in a very tangled condition, causing much hard work separating the sheaves before they could be stooked. With the present crop each sheaf was separated.

Summary

When this new method is employed the following points make themselves clear:—

1. There is a definite improvement in the straightness and shape of the sheaves.

2. Sheaves are not tangled together and consequently do not have to be separated before being stooked.

3. Stooking is quicker, less strenuous labour is necessary, and a more finished job results.

4. The sheaves stack more readily and there is an absence of bent, twisted and tangled sheaves when the stack is opened up for carting. This alone will eliminate much waste at the factory as sheaves will go to the deseeder and following factory operations in a manner allowing easy and better handling.

5. More labour is required on the machine when pulling.

Two operators on the side of the machine. One is taking the sheaf from the shield, while the arm of the second man can be seen extended to start the next sheaf.

6. Pulling times can compare favourably with those of the ordinary method providing the crop is not too long and coarse.

7. In a lodged crop it is doubtful if an improvement in the sheaf could be made.

While this new method of pulling appears very favourable it must be admitted that the men on the side of the machine were hard worked. In publishing this information the aim is not really intended to prove a new pulling method; it is more to explain the improvements already obtained in the hope that readers may benefit by it and possibly bring forward even better ideas. With the steady advance in improved pulling of crops this year the industry owes much to those men who, without any thought of monetary gain gave their time and energy to bring about the worthwhile improvements obtained.

ACKNOWLEDGMENTS.

Thanks are due to Mr. F. Ridder, of Otahuti, who took a very keen interest in the work and started the improved methods. Also to Messrs. Blue and MacPherson, of Waianiwa, Mr. H. I. Queale, of Lochiel, Messrs. Burnett, Clark, and Jackman, of Dunearn, who all went to considerable trouble and gave much of their time to help. Special thanks are due to Messrs. J. W. Paterson, Hokonui, and G. W. Rouse, East Limehills, who both allowed experiments to be carried out in their crops and went to much trouble to assist.

Messrs. F. Adams, Lochiel, J. F. Moylan, Northhope, and J. B. Munro, Lochiel, three contractors, also gave much time and thought to the work. Also the assistance given by the factory manager at Winton—Mr. J. F Greenall, was greatly appreciated.

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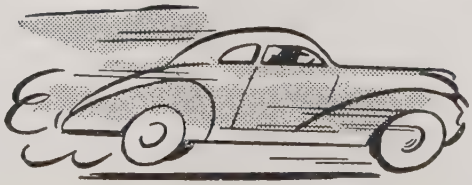

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And friction means wear!

If you'll cut your average driving speed from 50 to 35 miles per hour—you can get as much as 33% more mileage from your tyres!

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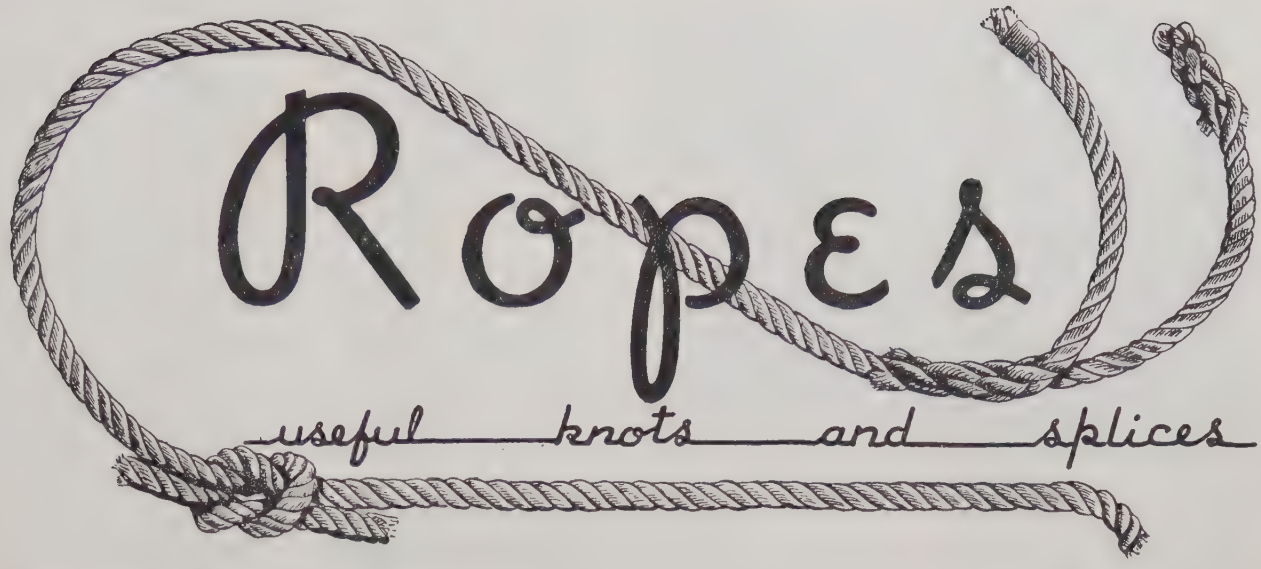

GOOD SOUND ROPE is at a premium. Care in storing and handling will lengthen the life of any rope. Rope should never be stored on the floor or in a closed container where air cannot circulate freely. When not being used, it is best stored on a raised slatted platform or hung in loose coils on wooden pegs. It should be kept out of the sun, away from boilers or other sources of heat, out of damp places, and safe from rats. When wet it should be hung in the shade to dry and not permitted to freeze. Some other practical rules for the care of rope are the following: During rainy weather loosen ropes between fixed objects outdoors. Protect rope from acids, chemicals, and strong fumes. Do not drag rope over rough surfaces, nor through sand or cinders. Avoid pulling out kinks; unwind properly. Do not overload rope or pull it over sharp corners. Use the proper size of pulleys and eyes. Rope should be inspected often for deterioration of fibres.

— By —

P. S. SYME,
Instructor in Agriculture,
Warkworth.

ROPES and cordages of various kinds have been used since very early times and the art of rope making is one of great antiquity. While the methods employed in the making of ropes have changed but little with the centuries, the material available has been greatly increased in range and improved in quality.

The ancients used animal hair and such vegetable fibres as were readily available, but modern ropes of the better quality are now almost invariably composed of hemp.

Fibre

While the Russian and American hemps are preferred for rigging purposes on account of their ability to absorb tar, the best ropes available for farm purposes are made from manila hemp, which is obtained from a species of wild plantain grown in the Phillipine Islands. The fibres of this plant are very fine in texture and range up to 12 feet in length, with a tensile strength equivalent to as much as 30,000 lb. per square inch. Manila ropes possess excellent wearing qualities, withstand exposure well, and are very pliable and easily workable.

Sisal hemp—a product of the agave plant found in Mexico and Yucatan is widely used for ropes of the cheaper qualities and for the manufacture of binder twine. Its strength is about 25 per cent. less than manila.

New Zealand flax is now being extensively used for the manufacture of ropes. Such ropes are light, pliable, and strong, but they do not possess the wearing qualities of hemp or manila. Flax fibre is now successfully used for the making of binder twine, for which purpose it is excellently suited.

Where ropes are intended for service under wet or exposed conditions, the fibre is usually tarred in the process of manufacture. This somewhat reduces the flexibility of the rope, and may weaken it by about 10 to 15 per cent.

Construction

In manufacturing a rope, a large number of individual fibres are twisted together in such a manner that, while each fibre contributes its strength, they can neither slip nor unravel.

An examination of an assorted number of ropes will show that though they may vary in size and strength, the principle of construction is similar throughout. The rope is built up step by step from a series of units, the fibres of these being alternately twisted to the right and to the left.

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Suitable fibres are selected and twisted to the right to form a continuous length of yarn. A varying number of these yarns are then twisted together to the left to form a strand. A number of strands, varying with the size of the rope, are now twisted to the right, and these form a hawser. If a heavy rope is required, three or more of these hawsers are twisted together to the left and form a cable. As a rule, ropes of less than three inches in circumference are hawser laid. Sizes ranging from three to ten inches may be either hawser or cable laid, and from ten inches and upwards in size, they are invariably cable laid.

A knowledge of these constructional details is essential in the splicing of ropes, and before attempting this operation, the novice should carefully examine the structure of a number of strands, yarns, and fibres, and should observe also how effectively these lock the rope together, while still holding the fibres parallel, with no possibility of their becoming unravelled when the rope is in use.

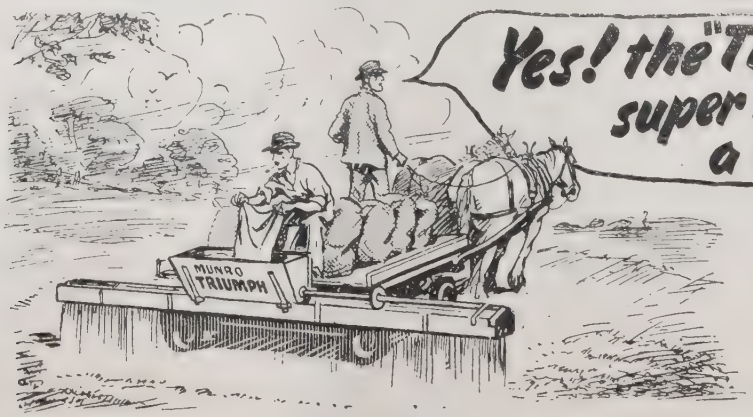
Ropes are made in coils to a length of 113 fathoms, and are tested by ascertaining the breaking strain of a free length of one fathom (6 feet).

New Rope

New rope will handle better if uncoiled from the centre of the coil in a counter-clockwise direction. If it starts to unwind in a clockwise direction, the coil should be turned over and the end of the rope pulled up through the centre. Uncoiling rope in the wrong direction makes it twist and kink, a source of much trouble if it is very long. Kinks in large ropes are hard to straighten out and they impair strength.

A short new rope can be suspended by one end with a light weight on the other end to equalise the strain in the various members. A long rope can be dragged across a comparatively level grass paddock to produce the same effect. Ropes dragged over a cultivated field or dirt road will pick up grit, which will injure the fibres.

Mechanical damage to rope can be caused by surface or internal wear, heat, or extreme tension. Surface wear occurs when ropes rub against each other or when they are dragged over sharp edges or rough surfaces. Too much tension on a rope, especially when it has been knotted or bent sharply over a thin support, will cause both surface and internal wear. Dirt



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or grit on a rope will work into the fibres and increase internal wear.

Dry rot is generally caused by improper storage conditions or by storing coils of wet rope. It is always best to stretch ropes out to dry in the shade. Where that is not practicable, the rope can be hung in large loose loops, well separated, over pegs in a dry, well-ventilated shed.

Rope fibres are destroyed quickly by chemicals contained in disinfectants, fertilisers, and manures, especially when wet. Tarred ropes are desirable in wet places.

Strength and Weight

While the strength of a rope depends largely on its quality and on its condition, the safe working load may be found from the approximate formula:

$$S = \frac{C^2}{20}$$

in which S = safe load in tons.
C = girth or circumference of the rope in inches.

This is for average manila rope in good condition.

Knots and Hitches

Although ropes and cordage are handled by everyone, it is rather surprising, considering the variety of knots and hitches appropriate for different purposes, that a proper knowledge of their use and application is not more widespread. To join two ends of a rope securely and efficiently is a very simple matter. There are many knots which can be used for this purpose, and each is specially well adapted for some particular condition. Yet how many people can do this only in one way—and that way wrong—by using a grannie knot.

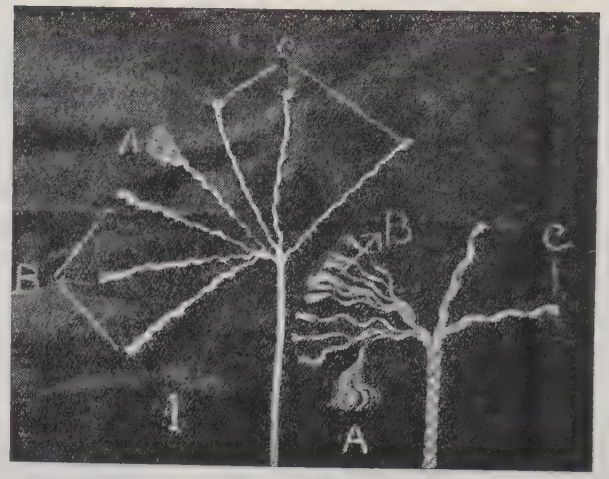

Fig. 1.—Construction of ropes, showing (a) fibres, (b) yarns, (c) strands.

STRENGTHS OF HEMP AND MANILA ROPES.

Material	Girth of rope in inches. 1	2	3	4	5	6	7	8	9
	Safe load in pounds:								
Average manila ..	100	400	900	1600	2500	3500	4900	6400	8000
Good quality hemp ..	80	320	700	1300	2000	2900	3900	5100	6400
Common hemp ..	55	220	500	900	1350	1950	2700	3500	4400

Rope is usually sold by weight, and the following table will serve as a guide when purchasing:—

Girth of rope	1″	1¼″	1½″	1¾″	2″	2¼″	2½″	3″
Length in feet per lb.	30	19	13½	10⅛	7½	6	5	3½

Care and Use

It is not very generally realised that when ropes are being used for lifting weights or for haulage purposes the strain imposed on the rope may be considerably greater than the actual force exerted on the weight being lifted. Much must depend on the angle at which the force is being applied.

Where ropes are used for pulley work, the diameter of the pulley should be proportioned to the size of the rope. The greater the diameter of a rope, the greater will be the internal strains imposed on the fibres by bending the rope; for this reason, heavy ropes should not be subjected to serious strains when bent at a sharp angle, and they should never be fastened to too small a hitching hook.

While good quality rope will withstand considerable wetting and exposure, it should be realised that deterioration is thereby accelerated, and the rope will give longer and better service if it is properly dried and stored when not in use.

The following knots and hitches have a wide general application; with a little study they can be mastered easily, and the daily routine will afford ample opportunity for their practical use.

Reef

When two rope ends are to be joined, one of the simplest and easiest ties is the reef knot (see Fig. 2b). It should be noted that the end which comes over from the top in the first loop should remain at the top when making the second loop. If this end is looped **under** the upper end, the result is a grannie knot (see Fig. 2a).

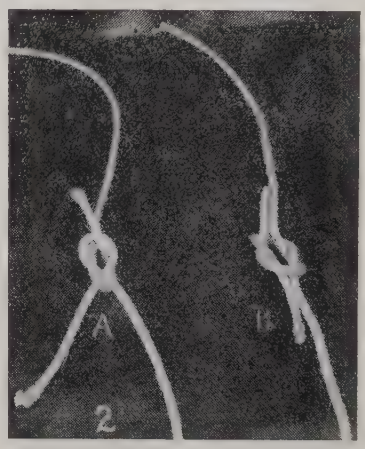

Fig. 2.—(a) Granny knot, should not be used; (b) Reef knot.

A reef knot is sufficiently secure for ordinary purposes, and if necessary it can be readily undone by pushing the two short ends together. A grannie knot is very liable to slip, and is often very difficult to untie. When using a soft twine, a reef knot can be made additionally secure by inserting one of the short ends twice through the second loop.

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Sheet Bend

This knot (Fig. 3) is adapted for joining two ropes of unequal size, but is safe only if the rope is kept tight. It can be made more secure by inserting an additional loop with the smaller rope. When used for small cordage where the ends to be joined are of equal size, the sheet bend makes a reliable and permanent knot.

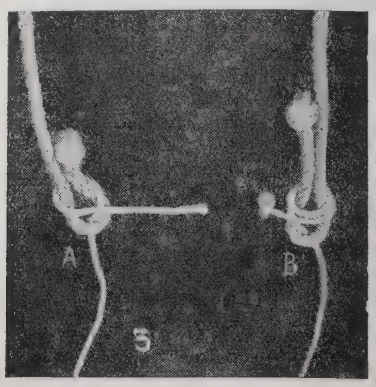


Fig. 3.—(a) Sheet bend; (b) Double sheet bend.

Fisherman's Knot

This is one of the safest of all knots, and if properly made it cannot possibly slip. It should be noted that there is a wrong way and a right way of tying this knot (see Figs. 4, 5a, and 5b). The fisherman's knot can also be used for joining ropes of different sizes by making a hitch of each short end round the rope and pulling it tight. This, however, makes the knot much harder to untie, as the two hitches cannot now be slipped apart by simply pulling on the short ends.

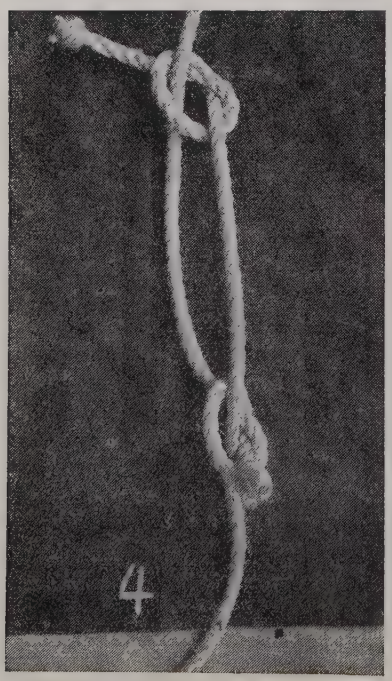


Fig. 4.—Fisherman's bend—wrong method.

Fig. 5.—Fisherman's knot (a) in making, (b) pulled up.

Carrick Bend

This is the usual method adopted in connecting two large ropes, and has the advantage that it can be applied at any part of either rope. It is sometimes used when setting up a derrick mast for uniting bights in the middle of two ropes. The central loop is then passed over the mast and the four ends used as guy ropes (Fig. 6).

Bowline

Where it is desired to make a running noose or a loop which will not slip or pull up tight, the bowline will be found a very useful knot. This knot is very simply made, it is easy to untie, and has a very wide range of application. It is one of the best knots for tying a horse as it cannot possibly tighten up and choke the animal. It is also a good knot for tying the reins to the bit rings, or for making a secure and non-slip hitch.

The knot is commenced by looping the rope as in Fig. 8a. Note that the loop must be made with the short end on top; and that the short end is led in from below, passed under the long end beyond the loop, and is then led up round this and passed down through the loop.

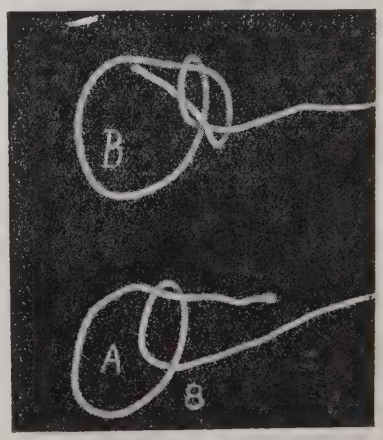
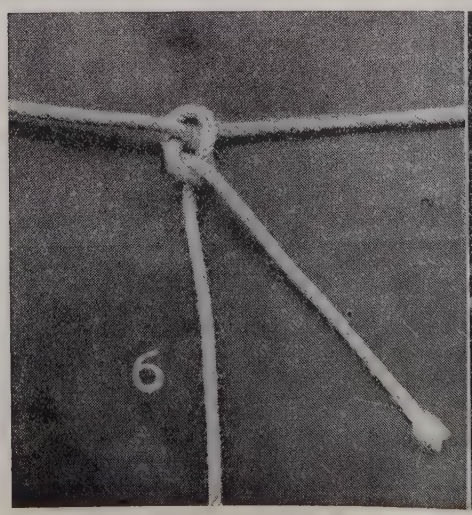


Fig. 8.—Bowline, (a) method of tying, (b) completed knot.



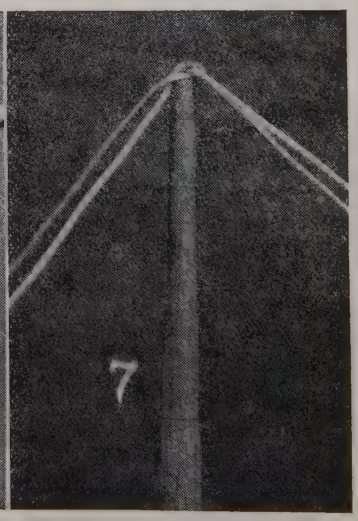


Fig. 6—Left: Carrick bend. *Fig. 7—Right:* This knot used as a guy.

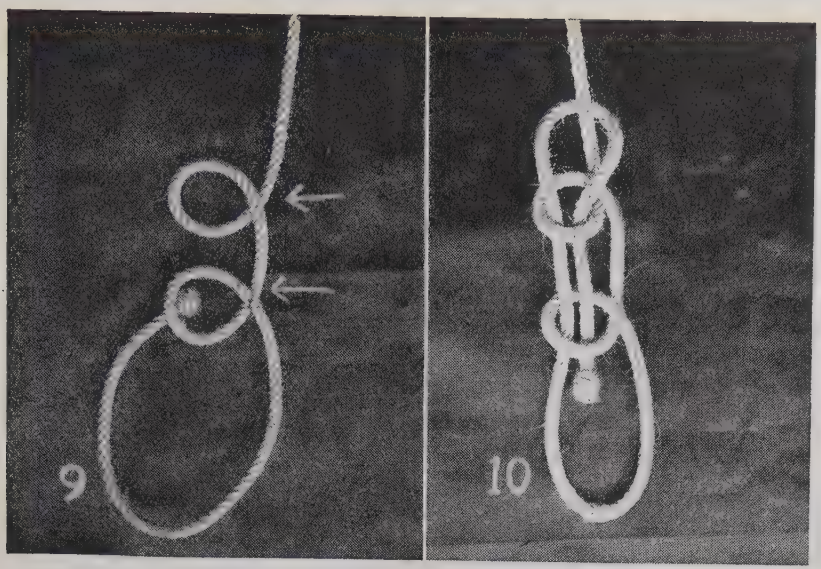


Fig. 9—Left: Water bowline, showing method of tying. *Fig. 10—Right:* Completed knot.

Water Bowline

This knot is perfectly secure and will not slip under any conditions. It consists merely of a loop with a bowline below, and is made with two loops (see Fig. 9), one above and one below, the short end being threaded through as in a bowline. The great advantage of this knot lies in the ease with which it can be undone when wet. This makes it particularly suitable for use under water.

Bowline on a Bight

Bowline on a Bight (Bosun's Chair).—This knot is sometimes used as a working cradle by painters, and is also used as the foundation knot in arranging a rope harness for throwing horses.

It can be made quite simply by first making an overhand knot as in Fig. 11 (a), and then pulling the ends through the loops as in Fig. 11 (b).

If the double rope loop "C" is then spread out to form two single rope loops, it can be used as the bosun's chair (see Fig. 12).

The bosun's chair can be easily made by doubling the rope and making an ordinary bowline knot.

Used for throwing horses, the double loop is passed over the horse's neck to rest on the shoulders, and the two single ends are led off between the front legs, round the hind feet, and back through at the shoulder. When the ends are pulled the animal is brought gently to the ground, and the hind legs are then held by hitching them with the ropes.

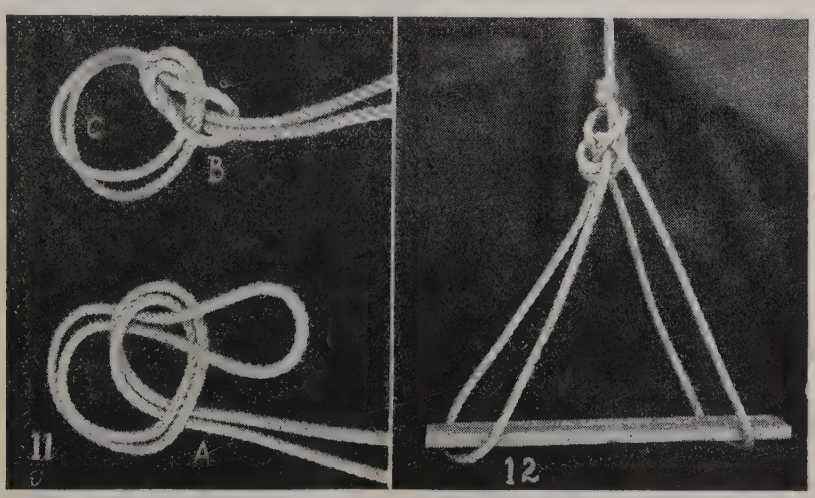


Fig. 11—Left: Bowline on a bight, (a) method of tying, (b) completed knot. *Fig. 12—Right:* Bosun's chair ready for use.

Hay Knot

This knot will be found extremely useful for lashing a load on a wagon, and for those engaged in carrying work it is indeed indispensable, as it can be used for roping round a load

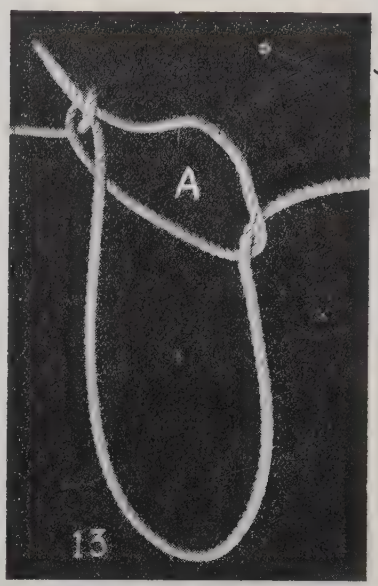


Fig. 13.—Hay knot.

or over it with equal facility. Its use gives a mechanical advantage of nearly two to one, and the strain can be easily held while the finishing hitch is made secure.

To make the knot reach up with the left hand and make a single loop at a suitable height (a). Then with the right hand double the slack of the rope into a loop, and pass this through loop (a) as shown in Fig. 13. Still holding an easy strain, the free end of the rope is led round a ring bolt in

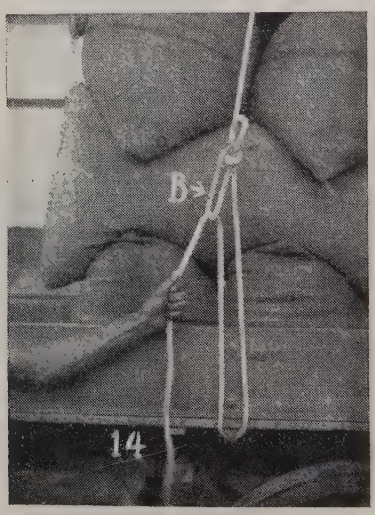


Fig. 14.—Hay knot in use.

Seed Production for Food

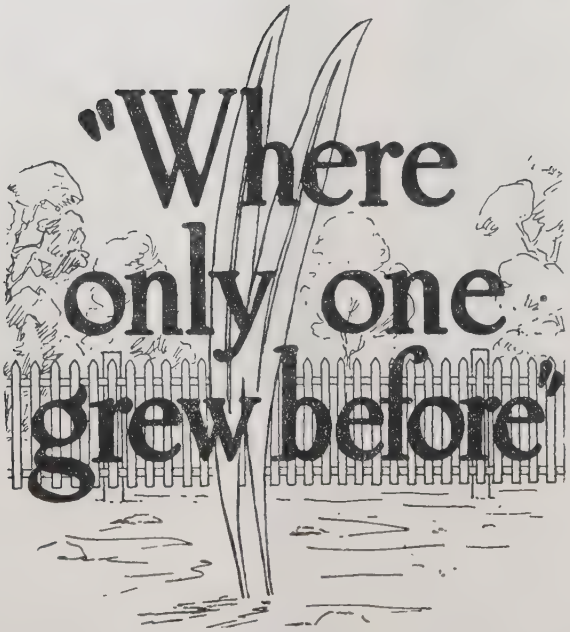


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Fig. 15.—Hitch used in securing hay knot.

the wagon and back through the loop 14 (b), which acts as a pulley and provides a purchase for tightening up the load. (See Fig. 14.) The knot is secured by a hitch as in Fig. 15. While this knot will never slip in normal use, it can be made proof against accident by a half hitch of the upper loop round the rope as in Fig. 15. This prevents any risk of the upper loop being inadvertently pushed through the hitch.

Sheep Shank

This is a variation of the hay knot, and is well suited for shortening a rope without cutting it. It is commenced in the same way as the hay knot, and is completed with a hitch round the bottom of the loop exactly similar to the first hitch at the top (see Fig. 16).

The sheep shank will not slip under strain unless either of the ends of the loop is pushed through the hitch. It can be made secure and permanent by hitching the loop ends round the rope as in Fig. 16.

Fig. 16.—Sheep shank.

Chain Hitches

Where it is required to hitch a rope to a chain, this can be done very simply and expeditiously as in Fig. 17 (a).

Figure 17 (b) shows a useful hitch for joining a rope to a closed link. This hitch will not slip in use, but it may work loose if the chain is left slack. It is intended chiefly for temporary work. The hitch shown in Fig. 17 (c) is absolutely slip-proof and is well suited for a permanent join.

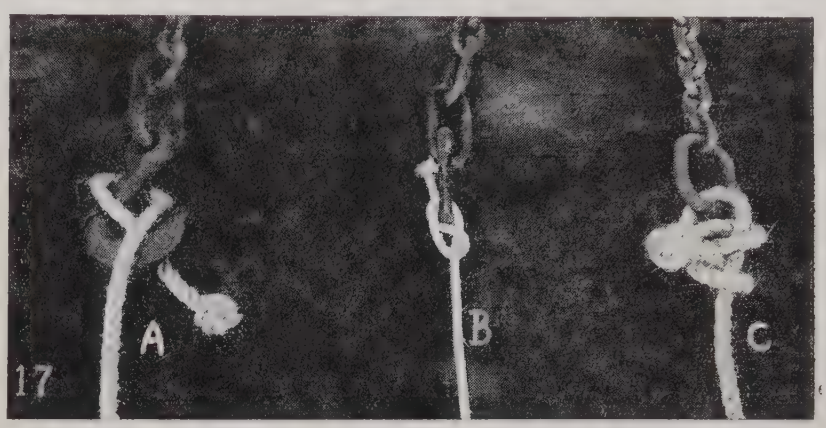

Fig. 17.—Chain hitches—three methods.

Clove and Timber Hitches

Hitches may be very conveniently used for lifting timber, or for holding a strain.

The clove hitch Fig. 18 (a) is very simple and easily applied, but it is liable to slip, particularly if the rope is wet. The timber hitch as shown in Fig. 18 (b) is safer in use, though rather more difficult to apply. It is commenced by an ordinary hitch as in Fig. 18 (a), the short end of the rope being then led some distance along the load when it is turned round to form a hitch, being finally tucked for several turns between the hitch and the load.

Rolling Hitch

This is regarded as the safest of all hitches, and is very commonly used for handling round timber. It is also useful for hitching an animal to a post or to a picket line, as in addition to being perfectly secure, it will not slip in any direction—either round or sideways. It can be very easily undone when the strain is removed. (See Fig. 20.)

Bottle-neck Hitch

This is at times useful when it is required to raise a barrel or tank in a vertical position, as for lifting water or for earthing a stack of silage (see Fig. 21).

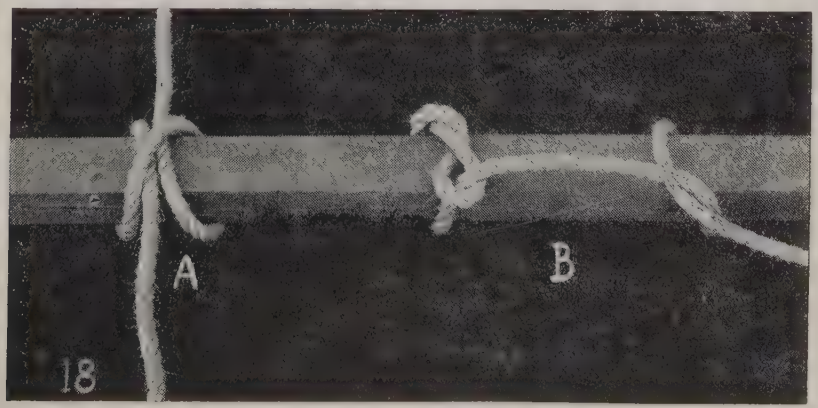

Fig. 18.—Clove and timber hitches.

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Avoid fancy foods, such as cakes, biscuits, sweets . . . Use wholemeal bread, MORE MILK, more vegetables, more fruit, more liver, more fish. Give children codliver oil . . . Where possible finish every meal with fruit or raw vegetable . . . Use the toothbrush morning and night; have the teeth examined at least twice a year from the earliest possible age.

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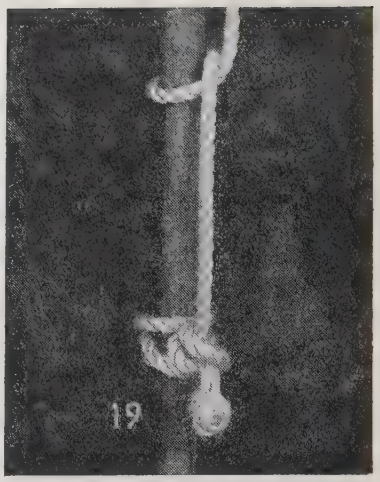

Fig. 19.—Well pipe hitch.

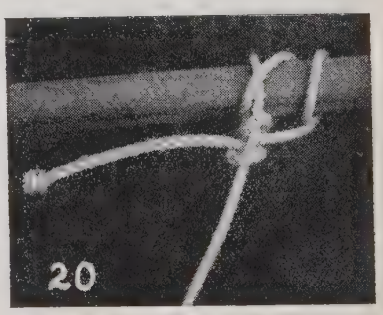

Fig. 20.—Rolling hitch.

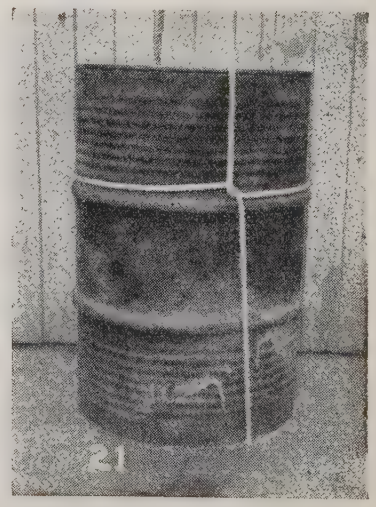

Fig. 21.—Bottle-neck hitch.

Manuring of Garden Crops

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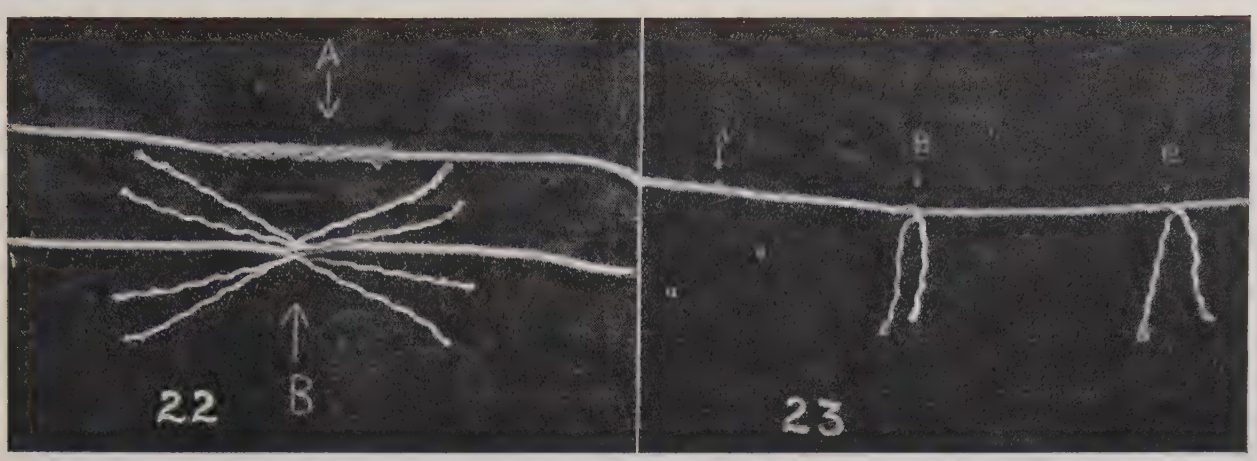

Fig. 22.—Left: Short splice showing start and finished. *Fig. 23—Right:* Long splice, showing one pair of strands completely worked in at (a) and two pairs cut off ready to be worked into rope at (b) and (c).

Splicing Ropes

Considering the extent to which ropes are used on the farm, a knowledge of splicing will frequently prove to be a very useful asset. Not only is the splice neater than any knot, it is also more convenient to handle, and if properly made it will still enable a broken rope to be used for pulley work.

Two types of splice are commonly used for joining rope lengths—the short splice and the long splice. The former is quite suitable for all general purposes, but where the rope is intended to pass easily over a pulley the long splice is much to be preferred. For practice work a slightly worn rope is better than a very new or a very old rope. A marlinspike is useful for opening up the rope.

The Short Splice

In a short splice the work is commenced by laying the strands back a short distance according to the size of the rope. For ordinary 1¼ in. plough line, seven inches on each of the ends to be spliced will be ample. The ropes are now intermeshed, with each strand of No. 1 rope between two strands of No. 2 rope. (See Fig. 22 (b)). One set of ends should now be lashed to the opposite rope to hold them in position while the other set is being spliced.

The strands of rope 1 are now interwoven along the unwound part of rope 2 by crossing each **over** its immediate neighbour and **under** the next. The rope may be twisted so as to open the strands, but it should be turned back again to tighten it as each strand is passed through. As each strand is dealt with, the rope is turned round in position for the next. When one circuit has been completed the strands of No. 2 are woven into No. 1 and this process is repeated, completing alternately a circuit at each end, pulling the strands up tight, and twisting the rope back to its original position to prevent slackness.

Where a tidy splice is desired, the strands may be gradually reduced in thickness, but cutting out one or more yarns at each circuit. The finished splice will then taper gradually from the centre to the ends. When the splice has been completed it should be rolled underfoot on an even floor to lock the fibres. This greatly improves the appearance of the splice, and the loose ends of the strands may then be safely cut off close to the ropes.

The Long Splice

This is more difficult to make than the short splice, but it is neater and is much to be preferred for pulley work.

Since it is three to four times the length of the short splice, the strands must be laid back a correspondingly greater distance, that for ploughline being about two feet. The rope ends are brought together in the same manner as when making the short splice. A strand of rope No. 2 is then laid still further back up the rope, and a cor-

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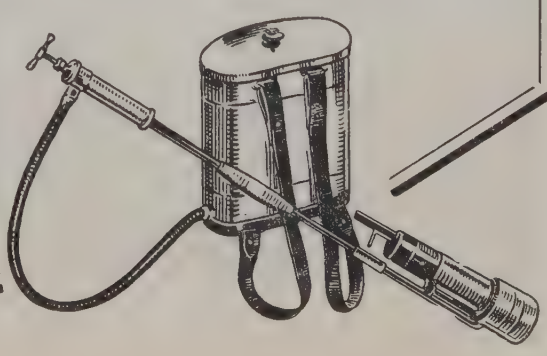

responding strand of rope No. 1 is worked into place. In the same way a strand of rope No. 2 is worked into the place of a corresponding strand which has been laid back in rope No. 1. As each strand is laid up into position, sufficient length should be left over to work into the main rope for the finish. In a three-strand rope each pair of strands should now project from the rope at the same distance from those remaining at the centre.

(Fig. 23a shows one end of the long splice completed, and the other strands ready for knotting and interweaving. Note the difference in the lengths of the ends.)

The splice is usually finished by taking about three-quarters of each pair of opposing strands and tying these together in the first loop of a reef knot, with the ends still pointing in these original directions. The six ends are then worked into the rope, each being gradually tapered off, the last fraction of each strand remaining being cut off and the end tucked into the rope.

The Eye Splice

This will be found very useful on leg ropes or for a running noose. It is also frequently worked round a thimble for fixing to the end of a chain or wire, though this operation requires considerable practice.

The strands are laid in the same manner as when commencing the short splice, the rope being doubled back to make the loop (Fig. 24a).

Holding the loop firmly with the left hand, the strands, commencing with the middle one, are woven into the rope with the right. It should be noted that when the rope has been doubled back the central strand should come over from the top, and the work should be commenced by weaving this strand **across** and **not with** the twist of the rope. Each strand is then taken in turn and worked alternately over and under corresponding strands of the neck of the eye, working always across the direction of twist.

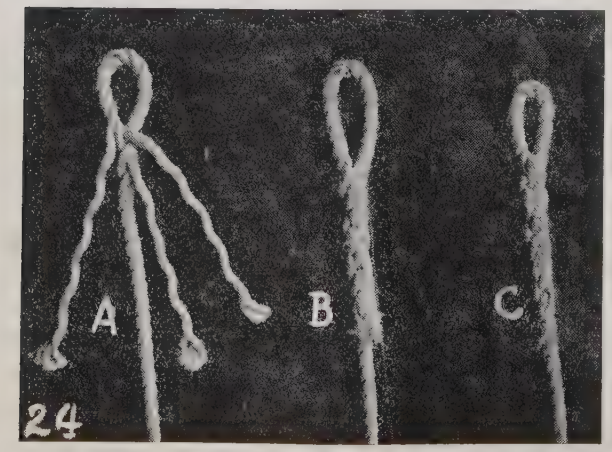

Fig. 24.—Eye splice, (a) start, (b) completed, (c) taper finish.

Crown Knot

This is performed by crossing the strands above the crown as shown in Fig. 25 (a). The ends of the strands are now pulled up tight, when it will

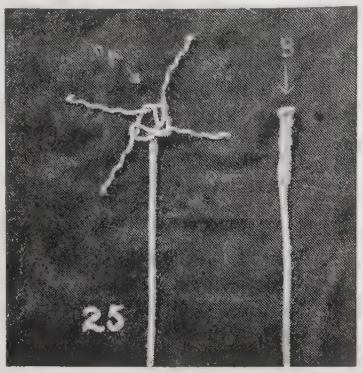

Fig. 25.—Crown knot, (a) start, (b) finish.

be found that they point backwards along the rope, so that they can readily be spliced in as in ordinary short splice. In practice the splicing is desirable, as a crown knot is liable to come undone. This method leaves a large knob on the end of the rope. (Fig 25b.)

Spliced Crown

In practice the best and neatest of all finishes is made by laying back about eight inches (for plough line) and then making a loop of one strand. The strand is then passed right round the rope and through the loop (Fig. 26a). Each strand in turn is then treated in this way—passing through the original loop and its own loop until the last strand passes through all the loops. The ends are then pulled up tightly, when they may be cut off short with no danger of their becoming undone (Fig. 26c).

The End Splice

Trouble is very frequently experienced with ropes unravelling from the end. While this may be prevented

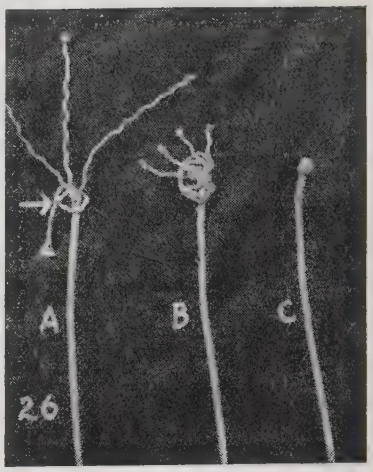

Fig. 26.—Spliced crown, (a) start, (b) strands looped, (c) strands tightened up and cut off.

by lashing the ends or by tying a knot, neither of these is quite so satisfactory as simply capping the end.

To obtain an end splice the strands are laid back a few inches, and a turn

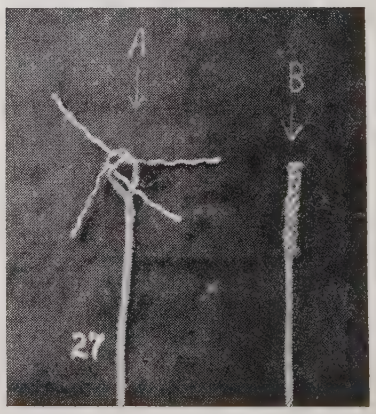

Fig. 27.—End splice, (a) strands looped, (b) strands pulled up and spliced back.

of each is taken round its neighbour (Fig. 27a). In a three-strand rope the third strand, after being turned round the second, is passed upwards through the loop formed by the turn of the first strand. The ends are now pulled tight and cut off about half an inch from the knot. They should not be cut too close or the knot will tend to loosen (Fig. 27b).

A FREE bulletin (No. 22), dealing fully with coccidiosis of poultry, is available from the Department of Agriculture at Auckland, Wellington, Christchurch and Dunedin.

Checking the Rat Menace

Rats are always with us, and they are always a menace, but recent reports indicate an alarming increase in their numbers throughout the country. In many places the position is serious, and authorities are seeking the co-operation of every farmer, householder and warehouseman in an effort to check the danger that is growing.

IT is the flea of the rat that carries two of man's most deadly diseases —plague and one form of typhus fever —the diseases that have periodically devastated the old world in days gone by. Incessant vigilance at our ports, however, prevents the entry of these diseases into the country. Rats are caught on ships and about wharves and examined, and the fleas they carry are also examined at the laboratories in

Contributed by the Department of Health.

Wellington and Auckland throughout the year. If a ship is infested an order is immediately made for its fumigation.

Within New Zealand, however, the rat population is increasing and they are getting into everything. Food is not safe unless it is properly protected, and even human beings are victims—the recent cases in Wellington and Auckland, where sleeping babies were badly mauled by a rat, is a horrible example of their boldness.

The Brown Rat

There are three main varieties of rats—the brown rat, the black rat, and the Egyptian rat. The brown rat is a denizen of sewers, garbage tips and drains, but is quite ready to make its home in any premises which offer suitable harbourage. It is larger and more aggressive than the black rat, and is a most prolific breeder. It has been calculated that one pair of brown rats, breeding three times a year, with a litter of ten, would give rise in three years, if the progeny all survived, to more than 20,000,000 of its voracious kind. The brown rat also burrows freely, making its eradication extremely difficult — and it is the brown rat which concerns this country most.

Rats serve no good purpose—they have none of the redeeming features that often characterise other pests. They live anywhere, they climb and they swim, and they eat anything. In New Zealand they not only destroy goods and foodstuffs, but they spread certain diseases—such as dysentery, food-poisoning, and possibly a form of jaundice—by contaminating foodstuffs with their excreta.

Next time you hear of a case of food-poisoning, just remember that the germs had to be taken into the body through the mouth or through food soiled by someone's hands through contact with flies or rats.

Some years ago, it was estimated that in Britain a single rat did about 7/6 worth of damage per year—and that meant a total loss to the country of about £15,000,000 each year. These are big figures, but when you are dealing with rats the figures are likely to become astronomical—a good deal greater than people suspect.

Preventive Measures

The offensive against rats must be continuous. It is no good opening spasmodic attacks now and again and letting it go at that. The warfare must be both destructive and preventive. All food supplies must be protected in rat-proof containers, and all waste food placed in metal bins with close-fitting lids. Heaps of rubbish provide shelter and food for rats; therefore, see that no refuse is left lying round the

A COMPLETE AND EFFECTIVE SOLUTION OF THE PROBLEM DEPICTED ON PAGE 157

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place. Stable and fowl runs should be kept clean, and accumulations of feed or refuse should not be permitted.

It is important that buildings, and this includes farm buildings, should be so constructed that rats can find as few places as possible in which to harbour and breed. In houses, all defects in brick or plaster should be made good. Rat runs and burrows should be closed with a mixture of cement and broken glass.

Dripping taps should be repaired and all water supplies, such as w.c. cisterns, should have close-fitting metal covers. Wooden floors in basements should be replaced with concrete at least four inches in thickness. All drains and sanitary fittings should be protected in such a way that the rats cannot enter the houses through them.

The owner of a premises infested with rats should not make his first question, "How can I catch those rats?" He should ask himself:—

1. How are rats getting into the premises — can I stop them?

2. Are they nesting and breeding on the premises — if so, where — and can I eliminate these nesting places?

3. How are the rats getting food and water — can I stop them?

If the problem is approached on these lines it becomes much more simplified. Even if the solutions of all the questions cannot be discovered, the application of the remedy appropriate to even one of them will probably give worthwhile results.

Rats are interested in premises in three ways, i.e., as a source of food, drink, or as a harbourage. If none of these are available on your premises the rat will go elsewhere.

Methods of Killing

Dogs, cats, and ferrets should be used to kill rats, and if you have taken practical steps for rat proofing buildings and sheds the adoption of these measures will be more successful, as the cover for rats is reduced.

Rat catching must be regarded as secondary to rat proofing. And to destroy rats you must ring the changes, as the rat is a cunning rodent and is hard to fool. Traps, if you have them, are effective, especially the break-back type. Wire cages are not very satisfactory as a rule, unless special precautions are used in setting and baiting them.

Barium carbonate poison is now available for the purpose of developing the campaign against rats, and supplies are obtainable free on application to local bodies. An effective way of preparing the barium carbonate is to mix it with four times its weight of meal, chopped vegetables, meat, or other bait. The following is a useful mixture:—Barium carbonate, 8 oz.; oatmeal, 16 oz.; beef dripping or tallow, 8 oz.; salt, ½ oz. Knead out into a paste, roll out into half-inch cubes—and you have your ammunition.

Wherever there is extensive burrowing, fumigation is recommended. Sprinkling of powdered glass along rat runways and holes is a very effective way of discouraging intruders. Rats will avoid wet tar, so this can be used in suitable places. A mixture made by heating together rosin and castor oil or colza oil in the proportion of approximately 2 parts rosin to 1 part of oil. The mixture should be spread on boards whilst warm and the boards should be laid in rat-runs so that rats become stuck if they venture on them.

Another dodge which will encourage rats to destroy one another is to place Epsom salts (dry) in tobacco tin lids and leave these where the rats have free access to them. The rats consuming the salts go mad and kill any other rats they can find.

The failure of measures to exterminate rats is usually due to two things—first, that they are frequently amateurish and half-hearted, and, secondly, they are localised. **Success will be achieved only by the simultaneous application of energetic and skilfully applied measures over wide areas.**

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Soil Erosion—A World Problem

Fundamental Concepts of Soil Deterioration (I)

— By —
LAI-YUNG LI,
Plant Research Bureau, Department of Scientific and Industrial Research N.Z., and Lingnan University, Kwangtung, China.

TO THE average observer, soil erosion recalls the ugly gullies on the slopes of mountains or hills. To the student of soil science, soil erosion is somewhat similar to tuberculosis of man, the development of which is a slow, complicated process. The development of gullies on the hillsides is but the final manifestation of the disease. There are a number of important changes which have taken place in the soil before its bodily removal, the main ones being: (1) Nutritional deterioration. (2) Physical deterioration. (3) Biological deterioration. (4) Water deterioration. All may occur simultaneously when the soil is mistreated by man.

NUTRITIONAL DETERIORATION.

By nutritional deterioration of soil is meant the loss of various plant nutrients (especially phosphorus, nitrogen, potassium, and calcium) including organic matter, through the soil depleting type of agriculture. Under natural conditions, such as in the forest or prairie, these elements are very slowly rendered soluble from parent rocks and made available to the plant roots. They are gathered up by the roots from lower strata of the soil and deposited on the surface of the ground when the leaves fall. Once they are brought into the biological cycle, the same plant nutrients are used over and over again. Undoubtedly, a small portion is lost through natural leaching, but the amount is remarkably small when compared with leaching under abnormal conditions.

When land is cleared of its natural vegetation and used for farming purposes, plant nutrients are lost mainly in the following ways:—(1) Sale of farm products (both animal and plant products); (2) leaching; (3) faulty handling of manure; (4) burning; and (5) erosion. The extent of nutrient losses depends upon several factors, especially the nature of the soil, the climate, and the agricultural practices of the area.

Losses of plant nutrients through sale of crops have been computed by Lyon and Buckman[2] from New York State. The average amounts removed annually under a standard rotation (five years rotation of maize, oats, wheat, clover, and timothy) were as follows:—

	Pounds per acre.
Nitrogen	60
Phosphorus	25
Potassium	50
Calcium	30
Magnesium	20

These figures should not be taken too literally, as different crops require different amounts of elements, and one crop may differ in its uptake of minerals from one year to the next, according to climatic conditions.

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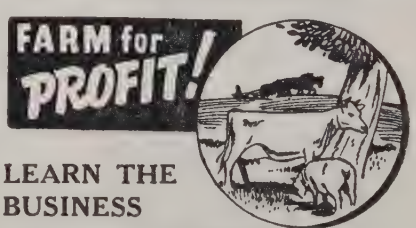

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A certain amount of nutrient is lost through leaching. That rain which penetrates through the soil profile carries away certain quantities of salts in solution, which are ultimately drained to the sea. This is especially so with the readily soluble sodium and potassium, and, to a lesser degree, calcium and magnesium. Loss of plant nutrients through leaching is governed by several factors, the main ones being rainfall and the surface conditions of the soil. Usually loss is greater from bare ground or poorly-covered areas than from forests or grassland. The following data secured by lysimeter studies[2] illustrate this point.

AVERAGE ANNUAL LOSSES IN POUNDS PER ACRE OF NUTRIENT ELEMENTS IN DRAINGAGE WATERS.

Locality and treatment of soil.	Nitrogen	Phosphorus	Potassium	Calcium	Magnesium
New York, U.S.A. Dunkirk silty clay loam (10 years treatment):					
Bare	69.0	trace	86.8	557.2	104.4
Rotation	7.8	,,	69.1	332.0	73.2
Grass	2.5	,,	74.5	364.0	81.3

Losses are high in calcium and negligible in phosphorus. This condition prevails generally throughout the upland soils of humid regions. Of significance is the much greater loss of nitrogen from areas which are bare. This immediately suggests the value of a cover crop.

Under the present system of agriculture, plant nutrients are also lost through careless handling of farm manure, allowing nitrogen to volatilise as ammonia. Furthermore, enormous amounts of organic matter are lost through the destructive annual burning of vegetation on hill country. Stevenson and Lei[4] reported the ill effect of fire upon vegetation and of loss in organic matter in Kwangtung Province, China. Lowdermilk[5], studying soil erosion in the Orient, named burning of vegetation on hills in many localities in China as one of the most important factors in soil deterioration.

Finally, nutrient losses occur through the loss of soil itself. A few figures taken from the Pennsylvania orchard soil management studies[3] will illustrate the amount of soil loss under different soil treatments.

ANNUAL SOIL LOSS IN POUNDS IN APPLE ORCHARD, PENNSYLVANIA, U.S.A. (data averaged for 1936-1939).

Soil Treatment.	Soil loss in lb. per acre.
Annual cultivation with 2 cover crops: Millet in spring, rye in autumn	8,362
Lucerne, spring cultivated to check sod growth	43
Blugrass sod, spring cultivated to check sod growth	23

The investigation showed that there was an enormous soil loss (and consequently nutrient loss) when land was cultivated annually as compared with areas permanently under bluegrass or lucerne.

PHYSICAL DETERIORATION.

Besides nutritional deterioration of the soil, there is also physical deterioration when the land is not properly cared for. Virgin soils possess a well granulated structure with the ultimate small particles—such as clay, silt, and fine sand—granulated into

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large water stable aggregates (above sand size). This condition is accompanied by the presence of a large amount of organic matter, abundance of grass or tree roots, micro-organisms, earthworms and other forms of life. Aggregation of soil particles, so important in the well-being of a soil, is especially rapid under a grass cover. This feature deserves more attention than it has yet received, for the function of stable sand-sized soil aggregates is to improve soil porosity, so important to free air and water movement in the soil. Without this feature soils become compacted and the spaces consist of numerous capillary pores which are of little value to air and water circulation.

Successful growth of crops depends upon good physical structure of the soil, i.e., soil with a high non-capillary porosity (loose soil), highly aggregated and well supplied with organic matter. Hitherto this phase of soil studies (soil physics) has been overshadowed by studies of plant foods and fertilisers (soil chemistry). As a result, malnutrition cases in crops are often wrongly attributed to deficiency of certain plant foods in the soil.

In fact, such maladies may easily be caused by poor physical structure of the soil. Under such conditions, the soil may contain ample plant food, but owing to compactness of the soil, the roots cannot reach it.

Under present agricultural practices, physical deterioration of soil is often brought about in the following ways:— (1) Blocking of root, worm and insect holes in the soil by agricultural tools which generally work horizontally (reducing porosity); (2) exposure of soil surfaces to the impact of raindrops causing disruption of the immediate surface layer; (3) the sliding effect of the plough, which destroys countless soil aggregates when passing through the soil mass; (4) the compact effects of over-grazing and heavy agricultural implements (sprayers, trucks, etc.); (5) burning of vegetation, which results in loss of organic matter and contributes towards deterioration of soil structure.

WATER DETERIORATION.

Accompanying nutritional and physical deterioration is water deterioration of the soil, i.e., decreased water absorption, storage, and supply. As an example of water movement under virgin conditions picture a vertical section through a forest. From the top downward there are tall trees, shrubs, ferns, mosses, liverworts, lichens, fungi, fallen twigs and leaves, surface soil highly aggregated, porous and enriched by organic matter, sub-soil and bedrock. When rain falls, the plant growth reduces the impact. Raindrops are held by leaves and branches temporarily, to be eventually evaporated. Others penetrate to contact with the forest floor before being finally taken into the soil mantle. Since the soil surface is so protected and the soil structure good, the rain water is taken into the soil very freely[7]. Unless the rainfall intensity exceeds that of the infiltration capacity, there will be no run-off. Water in quantity sufficient to supply plant needs is stored in the soil mantle. Under an artificial rain of three inches per hour intensity, it was found, in Pennsylvania, that the rate of infiltration of water in the forest is more than twice that of a cultivated orchard[7].

When forests are cleared and erosion allowed to take place, water deterioration occurs for the following reasons:—

1. Decreased interception of rain which materially alters the soil surface which in turn impedes water intake.

2. Decreased infiltration (water intake) with increased loss of water by run-off.

3. Decreased water storage with decreased water supply to the plants.

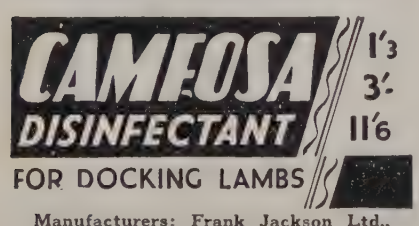
Water is essential to life. Its loss means poor or no crops for the farmers, floods in the plains, and erosion on the slopes.

BIOLOGICAL DETERIORATION.

Nutritional, physical, and water deteriorations of the soil are often accompanied by a marked decrease in biological population. Depletion of the supply of organic matter by cultivation has been shown by Jenny[8], in Missouri, U.S.A. An undisturbed virgin prairie soil was compared with an adjoining field cropped to maize, wheat, and oats for 60 years without the addition of manure or fertiliser. More than one-third of the organic matter, representing centuries of accumulation, was destroyed in this period. Together with reduction of soil organic matter goes reduction of soil porosity, especially the volume of larger pores through which water penetrates readily and soil receives its necessary ventilation. In many cases, from 25 to 30 per cent. more soil is compacted into a cubic foot than was present in virgin soil[6]. Under such conditions, the biological population, so necessary to a healthy soil, is very much reduced. Under extreme eroded sites, the soil is practically structureless, lifeless, and almost infertile.

BODILY REMOVAL OF SOIL

Soil deprived of its nutrients, good physical structure, moisture, and biological population, including binding roots, offers no resistance to the action of moving water. The result is bodily removal of soil, commonly known as



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soil erosion, which occurs at a great rate. Structureless soils contain mostly non-water stable particles, which are brought into suspension and carried away by the run-off water[9].

Any system of soil erosion control (soil conservation) should include nutrient conservation, maintenance of soil structure, conservation of moisture, and maintenance of a high degree of biological activities in the soil mass.

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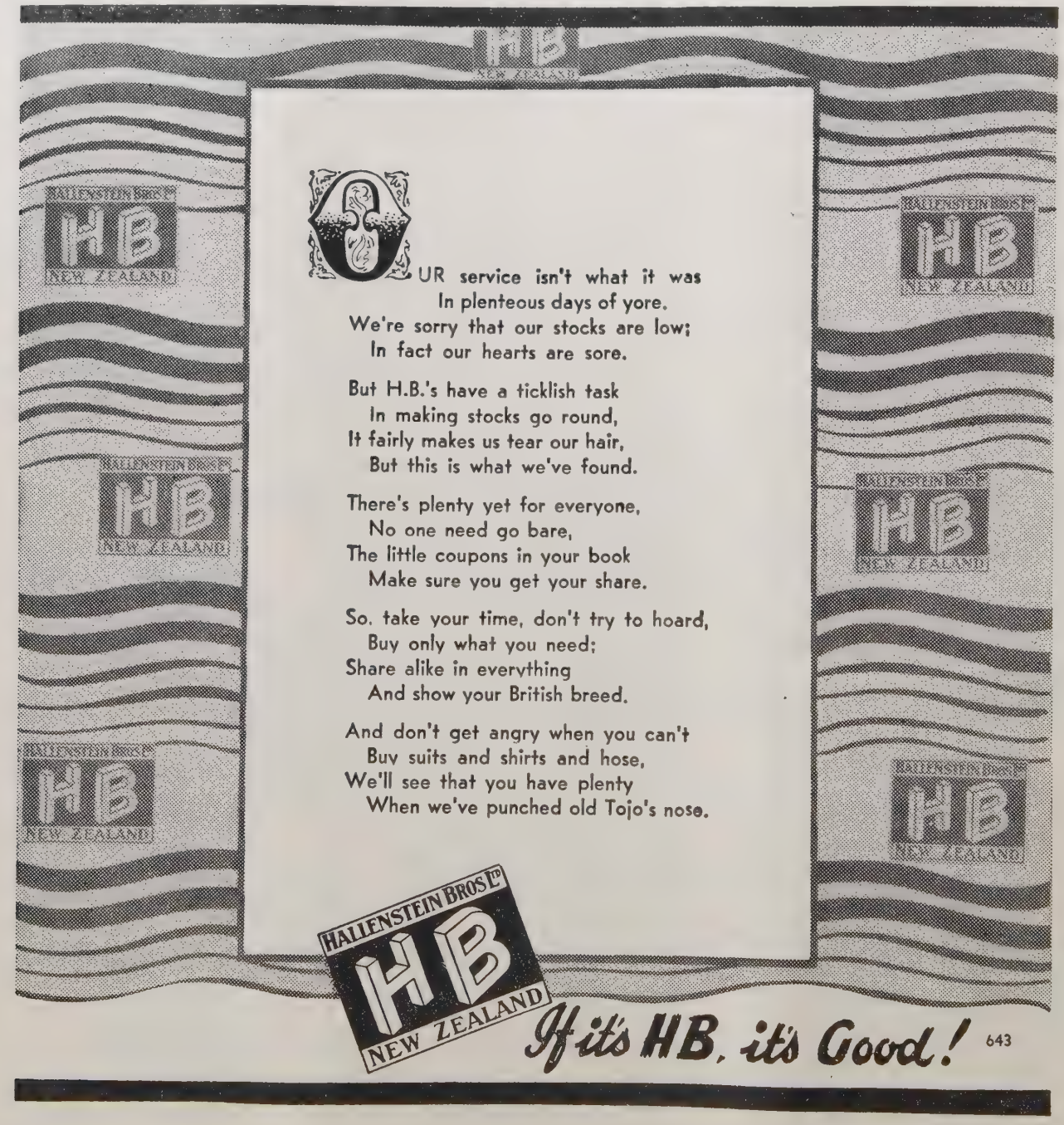
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Rugging of Sheep in Canterbury

Report of Trial

—By—

T. K. EWER, Veterinary Research Officer, Christchurch.

DURING the few years immediately preceding the outbreak of war, considerable interest was being shown by farmers in Canterbury in the question of rugging their sheep during the winter. The same interest was manifest in other countries and a number of trials were carried out and their results reported.

Elliott, 1939, reported that rugging Merinos in a very dusty district in N.S.W. over 13 months, although resulting in an increased wool price was entirely uneconomic. Montgomery, 1939, in a careful trial over two years with Merino cross 2-tooth wethers concluded that even with the freedon from burr, excessive dust and fleece rot that rugging gave, it was not economical.

Similarly when the effect of rugging on ewes and the subsequent growth of their lambs, and upon hoggets during the winter months in the cold and wetter parts of N.S.W. was examined in controlled experiments by Levy, 1939, and Montgomery and Blumer, 1942; by Peirce, 1938 in South Australia, and by Thomas and Throssel in 1939 in W. Australia, it was found in every instance that there was no advantage to be gained by rugging.

On the other hand, Duncan, 1939, reported favourably on the practice from the point of view of increased wool value under certain conditions, e.g., in the Mackenzie Country, where both dust and severe winter conditions occur.

The Department of Agriculture commenced investigations at Kirwee into various problems associated with sheep mortality in Canterbury at the beginning of 1940, and the opportunity was taken during the winter of that year, and again in 1941 and 1942, of conducting a rugging trial on hoggets.

Weight

The primary purpose was to find out the effect of rugging upon the body weight of over-wintered hoggets under the plains country conditions of Canterbury and only secondarily to investigate the effect on the wool.

It is obviously important to decide whether the climatic conditions experienced over the past three winters have been at least of average severity. The nearest meteorological station at which complete records are kept is at Canterbury Agricultural College, Lincoln, 20 miles away. It will be seen from the final table that it can fairly be said that apart perhaps from the winter of 1940, results we have obtained from rugging can be regarded as applying to typical winter conditions on the Canterbury Plains.

The period of rugging each year extended from May until the hoggets were shorn in October. The type of cover used was one made of fairly heavy canvas, roughly shaped, and fastened across the brisket and straight across the britch by an adjustable rope. It appears to be a very satisfactory design and the only adjustment necessary was to increase the length of both neck and crutch ropes as the hoggets grew.

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The sheep used were Corriedale hoggets, mostly ewes, aged about 8 months at the commencement of the trial.

Wool

At shearing the total fleece weights of all hoggets were obtained and samples taken to ascertain the clean scoured yield. In 1941 and 1942 the skirted fleeces of the rugged and unrugged sheep were baled and appraised separately.

The total body weight gain, fleece weight and wool price are shown in the following table:

Year	Treatment	No. Sheep	Gain lb.	Period days	Fleece weight lb.	Wool Price
1940	Rugged	45	23.0	189	8.7	—
	Unrugged	45	24.6		8.6	—
1941	Rugged	76	24.5	133	8.8	15¾d
	Unrugged	79	24.5		8.9	14¼d
1942	Rugged	100	17.7	140	9.0	17½d
	Unrugged	100	19.1		9.2	17½d

Clearly then, under winter conditions on the Canterbury plains the rugging of hoggets is not likely to result in higher weight gains, and the greasy wool weight will similarly not be affected. In 1941 the wool from rugged sheep was sold for 1½d. lb. more than the unrugged wool. However, the covers cost 3s. each while their average life appears to be 3 years, so that even if the average yield of greasy wool is taken at 9lb. per sheep, rugging only meant a gain of 1s. 1½d. per sheep, which would not make it an economic proposition. In any case, since there was no difference between the appraisal price of rugged or unrugged wool in 1942 it would appear that a differential price cannot be counted upon.

Conclusion

Under average winter conditions on the Canterbury plains, the rugging of hoggets, whether from the point of view of increase of body weight, fleece weight or wool price is not likely to prove an economic practice. This does not preclude the possibility that benefit may accrue in districts where dust or more severe winter conditions occur.

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APPENDIX

TEMPERATURE SUNSHINE AND RAINFALL: LINCOLN COLLEGE.

Month	Grass Min. Deg. Fah.	Screen Min. Deg. Fah.	Av. Temp. Deg. Fah.	Hrs. Sunshine	Rainfall
1940.					
May	35.7	38.4	45.9	158	7.17
June	29.2	34.2	43.3	138	1.21
July	30.5	34.8	42.6	124	2.25
August	33.2	38.0	45.9	144	1.11
September	37.2	41.7	49.4	133	3.80
1941.					
May	31.3	40.5	49.5	132	2.19
June	28.7	34.2	41.9	97.9	3.95
July	29.0	34.1	41.9	106	1.03
August	33.0	38.5	43.7	66.7	9.30
September	34.8	39.9	49.4	152.5	1.74
1942.					
May	35.3	42.4	49.8	73.9	6.91
June	28.1	35.5	44.3	122.3	0.35
July	28.3	36.2	44.0	84.6	3.27
August	27.8	36.5	45.4	135.4	0.69
September	31.5	40.7	50.2	146.3	2.48
AVERAGE 1896-1942.					
May	34.3	39.8	48.5	136	2.31
June	30.7	36.3	44.6	118	2.43
July	30.0	35.2	43.3	117	2.71
August	30.9	36.5	45.0	153	2.03
September	35.0	40.3	49.4	178	1.91

WEEDS

Biennial Weeds

— By —
S. H. SAXBY,
Instructor in Agriculture,
Dunedin.

Flannel leaf (*Verbascum thapsus*) is also called mullein and Aaron's rod. It is a biennial plant with a strong taproot, and in the first year consists of a rosette of leaves that are covered on both sides with a dense mat of woolly hairs. In the second season the plant throws up a stem about 4-5 feet in height along which are clustered its bright yellow flowers. Flannel leaf is of moment, more on account of its striking appearance, than on account of the harm caused by it. It is neglected by all classes of stock and is consequently able to set its large quantity of small seeds without hindrance. Flannel leaf is essentially a weed of dry situations, and is commonly seen in riverbeds and dry hillsides, on road cuttings, and shingle plains. It is very common in parts of the depleted country of Central Otago, where even the rabbits will have nothing to do with it. On good country and on second-class country that is carrying even a reasonably good sward flannel leaf seldom establishes.

Flannel leaf is essentially a weed of dry situations. Here it is growing on a dry shingle plain.

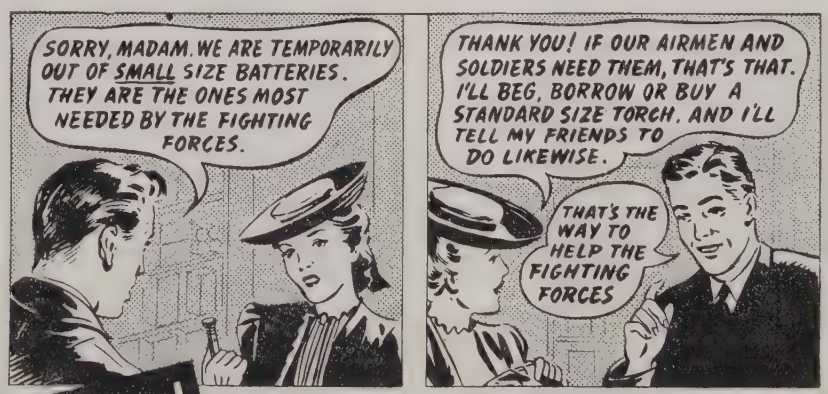
Grubbing or pulling before it seeds is the only method of control possible, but on account of the type of country on which it grows this practice is seldom economical, and the weed is usually left to spread as it wills. On somewhat moister country a rather similar plant—**Moth mullein** (*Verbascum blattaria*) is found. It is, however, only slightly hairy, and its leaves are of a brighter green colour.

Foxglove (*Digitalis purpurea*).—This plant belongs to the same family as does flannel leaf, and, whilst growing in somewhat similar situations, requires a considerably higher rainfall in order to reach its maximum distribution and development.

Foxglove is essentially a weed of low fertility and open swards, and is seldom, if ever, found on rich well-grassed country or on arable land. It is on one time bush and scrub country that foxglove is most common. Here, owing to an open sward, due to burning or to the failure of the sown grasses to establish and persist, foxglove, which is a prolific seeder, will often gain entry and increase rapidly.

Foxglove is usually regarded as a biennial plant, but may frequently, due to growth from side shoots, become virtually a perennial.

In the control of foxglove two aspects must be considered. These are—first-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ly, the eradication of the plant, and secondly, the creation of conditions that are unsuitable for its continual re-establishment; that is, sward improvement.

Regarding the eradication of the plant, there are three alternatives, namely, cutting, pulling, and grubbing. Whilst the latter two are quite satisfactory in that they eradicate the plant, the act of breaking the turf merely prepares a seed bed for the large amount of seed that has probably already fallen. Over a period of years this practice would no doubt be effective if carried out regularly, but occasional treatment has seldom proved to be satisfactory. On the other hand, cutting prior to flowering will prevent seeding, but may tend to encourage the plant to become of a perennial nature.

On the whole, however, the complete control of foxglove is very difficult, largely on account of the fact that the land on which it frequently grows is of such low value that eradication is relatively too expensive.

The question of pasture establishment and pasture improvement in relation to weed control in general is of major importance when considering pasture weeds on any type of land. On unploughable country the initial sowing down determines to a considerable extent the inroads that weeds will make in the years to come.

The sowing of temporary or non-mat-forming species invariably leaves, after a short period, spaces for weeds of all kinds to gain entry. On the other hand, the sowing of aggressive, mat-forming species such as browntop ensures the maximum ground coverage with a consequent reduction in bare spaces in which undesirable species can gain entry and establish.

Weed control certainly does not begin and end with the selection of suitable plants for sowing down, but there is no doubt that this aspect does have a considerable influence on the future weed content of the pasture.

There is considerable evidence to show that foxglove, as in the case with some other weeds, has decreased to a marked extent during the past twenty years or so, and is not now regarded as the menace that it was.

At the present time foxglove on account of its striking appearance is liable to attract more attention than its importance as a weed warrants.

Hemlock (*Conium maculatum*) is a biennial or perennial moisture loving plant belonging to the carrot family, and is sometimes erroneously called wild carrot, or wild parsnip, to which plants it is superficially similar. When in flower hemlock reaches a height of some 5 to 8 feet under good conditions. The hollow flowering stem is smooth and is "splashed" with purple spots. The flowers are white and quite small but on account of the large number present on each head they are collectively quite conspicuous (see illustration). The leaves are deeply divided in the same manner as are carrot leaves. When bruised the leaves emit a most offensive odour.

Hemlock is present in most districts in New Zealand, but is more common in the higher rainfall areas. It is commonly seen in these districts on waste land such as empty sections, stockyards, and moist, shady hillsides.

The poionous properties of hemlock are well known, but, as it is seldom eaten by stock, it is only on rare occasions that poisoning by it is encountered.

In common with a number of other plants stock dislike hemlock on account of its offensive odour and will eat it only when hard-pressed for food. This applies particularly to cattle. Sheep will eat it more readily. Although it is a strongly tap-rooted plant, hemlock succumbs readily to cultivation, and is seldom seen in paddocks that are periodically under the plough. Sometimes, however, hemlock may take charge of appreciable areas of unploughable land such as steep, shady hillsides.

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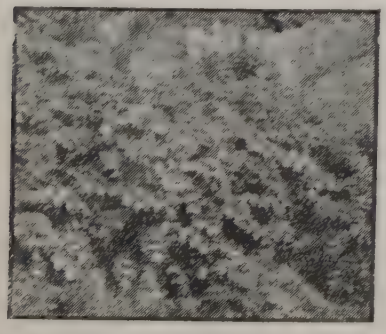
Hemlock is frequently found on roadlines and waste places. Here it and convolvulus are growing alongside the road in a wet district.

Hemlock may be killed quite readily with sodium chlorate. Several applications may, of course, be necessary on account of the presence of seedlings which come up after the parent plants have been disposed of. However, in spite of its bad reputation and conspicuous nature, it cannot be regarded as being one of the serious weeds of this country.

Milk thistle (*Silybum marianum*) is also referred to as variegated thistle. This is one of the largest of the various thistles that have become established in New Zealand. The leaves have a very striking network of milky white veins and may reach a length of two feet. The flower heads which are borne on stems up to five feet in height are purple in colour and are surrounded with long, sharp-pointed spines.



Milk thistle gains rapid entry when the ground cover is disturbed. In the illustration milk thistle is seen establishing on a slip.

Milk thistle thrives on loose-textured and warm soils, and is found chiefly in the North Island and isolated parts of the South Island. It is very seldom that this thistle is present over large areas of country. Nevertheless, in some districts it has, on occasions become very prevalent. As a rule it forms isolated but very dense communities where it smothers out all the grasses. Just as is the case with other thistles, a broken turf encourages the ingress of milk thistle, consequent it very commonly takes complete charge of sheep camps. Here, on account of the higher fertility, it grows particularly vigorously.

Milk thistle may be controlled by grubbing while the plant is in the rosette stage. This method, however, has the objection that the very act of grubbing is also the preparation of a seed bed for the next batch of thistle seedlings. On account of the thistle's ability to establish and grow very rapidly, the surface sowing of grubbed areas with good grass and clover is seldom very effective, as the latter are unable to compete successfully with the thistle.

Although the thistles may be killed with sprays such as sodium chlorate, this practice can on account of cost be recommended only when the areas to be dealt with are relatively small, and where it is desired to prevent one small area from spreading to other parts of the property. On arable ground milk thistle is of little moment as it succumbs readily to cultivation.

In general the incidence of milk thistle is very variable. In some years it is practically absent in places where previously there have been dense communities of it.

Scotch thistle (*Cirsium lanceolatum*). —On account of its wide distribution this is the best known of the various thistles present in New Zealand pastures. It reaches its maximum development and aggressiveness on country that has at least a fairly high moisture supply for most of the year, and consequently it is particularly common throughout the higher rainfall districts. In districts where the rainfall is low, Scotch thistle is common only on the higher fertility country where the moisture retaining capacity of the soil is high. In some dis-

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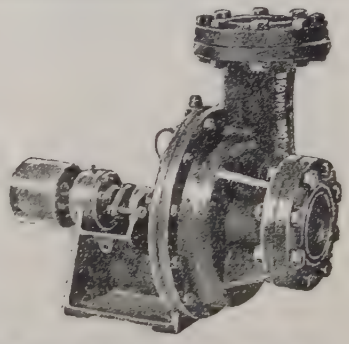

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tricts where Scotch thistle has become very aggressive it forms dense, almost impenetrable pure associations which kill out all the grasses.

During the '60's and '70's of last century Scotch thistle spread very rapidly and widely, so much so that it was regarded as extremely serious. Considerable areas of good country were completely dominated by it. Since that time, however, the thistle has dwindled considerably; in fact, some areas that were at one time dominated by it are now virtually free.

As is the case with most other weeds, the control of Scotch thistles should commence with the prevention of its establishment rather than with its destruction when established. Probably the most common cause of Scotch thistle infestation is the openness of the sward during the time that it is in a transitionary stage. This stage is when the temporary elements of a pasture are dying out, and before the permanent ones have filled up properly.

On what is called the browntop country of Otago and Southland Scotch thistles are very seldom present in old pastures that are carrying a dense mat of browntop. As soon, however, as this country is broken up, limed, and manured, and sown down in "English" grasses Scotch thistles appear. In about 3-4 years the pastures frequently show signs of "running out." It is at this time that the thistle population is usually at its maximum. In subsequent years, when the browntop is gradually taking charge again the thistles gradually disappear. On some of this country grass grub and caterpillar attack is also often severe. The action of these pests frequently results in a rapid opening up of large areas which become virtually bare—an ideal seed bed for many weeds—and a condition very favourable to the establishment of Scotch thistle.

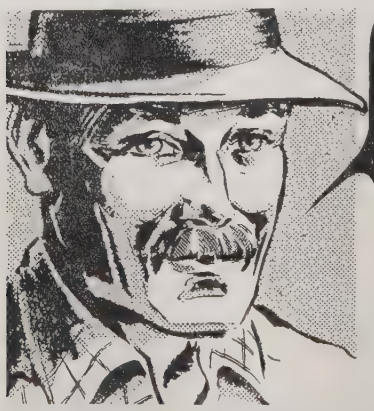
On heavy country very similar trends are obvious. Scotch thistles are usually worst following a period in which the sward has been opened up. Winter poaching is probably the commonest cause of the ingress of Scotch thistles in this type of country. The sowing of short-lived strains of "English" grasses and clovers is also reponsible for the early and successful establishment of these thistles, irrespective of whether the land is first or second class. On the other hand, the sowing of permanent or certified strains of pasture plants not only increases the total production of herbage, but also acts as a very efficient check in the ingress of weeds such as Scotch thistle. Scotch thistle is in general a biennial plant. In its first year it forms a dense leafy rosette up to 18in. in diameter, which usually smothers the grasses below it. In the second year a flowering stem about 3ft. in height or more is produced. After having flowered and produced its seed the plant dies.

The two swards on either side of the fence have had identical treatment except that the one on the left was sown with short-lived strains of pasture plants whereas the one on the right was sown with persistent strains. The relative infestation of Scotch thistle in the two paddocks is very striking.

The elimination of thistles in an established pasture may be carried out in several ways. They may be grubbed in the rosette or flowering stage; they may be poisoned with a 5 per cent. spray or dust of sodium chlorate, or they may be mown prior to seeding. Which method, if any, is used depends on the cost in relation to the result obtained. Whether large or small areas are being dealt with, the surface sowing of a small quantity of good seed on the bared areas will assist in the prevention of the re-establishment of the thistle.

Summed up, the control of Scotch thistles and many other weeds for that matter, should be a case of prevention when the pasture is in its young stages rather than one of a cure, the cost of which may be prohibitive.

(To be Continued).



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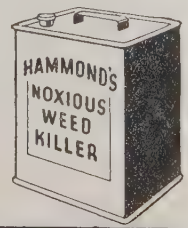

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through until maturity is reached. While replacements may be made by purchased heifers, many dairymen have found that if they want healthy, disease-free, productive herds, they must raise their own heifers.

SUCCESSFUL calf-rearing begins with the right feeding of the calf from birth onwards, although to ensure a healthy, virile calf at birth the cow must be well wintered and fed during the dry period. It is noted that the average weight of calves, those sent forward for slaughter as bobby calves, is lower when the dairy herds have been subjected to a severe winter period.

When the calf is born in the paddock the cow normally licks and dries the calf. The majority of strong calves are endeavouring to suck within an hour or two after birth. The first milk obtained by the calf is of considerable importance in giving it a good start in life. This milk acts as a laxative to clean out the digestive tract. It has other valuable properties in helping to protect the calf from early infections and diseases. The high vitamin A potency of the first milk promotes growth and well-being. It is most essential, therefore, that each calf intended for farm-rearing should be started off by having the first milk from its dam.

With the approach of spring, the problems of the rearing of calves will present themselves, and ills arising from faults in management will become apparent and cause serious loss. The outstanding trouble, both by virtue of its prevalence and its seriousness is "scour" or diarrhoea in the young stock, and a brief discussion of the cause and effect of the trouble may be of some benefit.

Scours

There are a variety of conditions which may cause scour in calves, and several separate factors may operate at the same time. In all cases, however, a common factor is involved—faulty feeding either in the nature or the quantity of the food. The basic factor which leads to manifestation of the upset is some disturbance in the digestive tract, and the disease can be divided broadly into two conditions, namely, nutritional scours and bacterial or "white scours." It is often difficult, or indeed impossible, to differentiate clinically between diarrhoea due solely to improper feeding and diarrhoea that is of an infectious type, but in the great majority of cases improper feeding and diet are the dominant cause, and once the scouring is established infection may become the chief factor.

Some calves may scour through eating straw or foreign material, or from eating coarse hay at too early an age, and once started this may be difficult to control, because the foreign material remains in the stomach for a long time. Scouring may even be induced by changing from colostral milk (first milk) to the milk of the herd at too early a date; that is, before the fourth or fifth day. However, this latter scour is more or less transient, and, provided infection does not become established, will clear up under treatment within a few days. The most prevalent cause is the feeding of excess quantity of milk at each meal, and is the common factor involved in the causation of so-called nutritional scour.

Under normal conditions, a calf suckles at numerous occasions during the day, and the quantity taken each time is small. When the calf is pail-fed, however, the number of times of feeding is greatly reduced—to three, or even to two, feeds per day. The result, if the quantity of food allowed is excessive, is obvious. The calf, being hungry, drinks to excess, with the result that a hard, indigestible curd is produced in the stomach, which so

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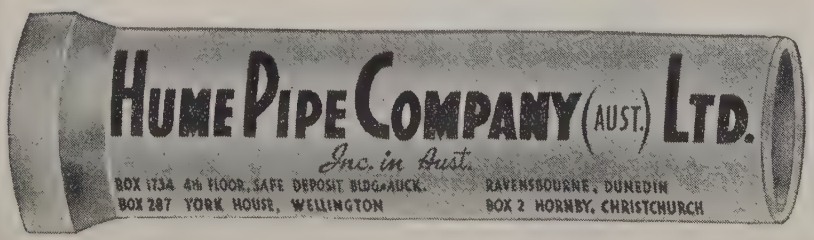
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irritates the stomach lining that it leads to inflammation and increased activity of the intestine, with the result that food is forced through the intestinal canal at a rapid rate, so that no absorption of food can occur. Outwardly, the disease is manifested by the diarrhoea, with thin, watery, foetid droppings, by the general depression, fever, thirst, and lack of appetite. Inwardly, the effects revolve upon the inability of the calf to absorb nutriment and the feverish condition induced by the bowel inflammation. This condition is most likely to occur in calves from a few days old up to approximately three weeks, but it must be remembered that carefully controlled and systematic feeding is essential much longer than this period, since faulty diet can give rise to digestive disturbance also in older calves.

White Scours

"White scours," "bacterial scours," or contagious diarrhoea are the terms employed to differentiate the type of diarrhoea caused by actual infection as distinct from nutritional scours. Again, however, it should be mentioned that the two frequently occur together, beginning as a simple dietetic diarrhoea to which the bacterial infection becomes super-imposed. The vital factor in the establishment of this disease is the multiplication of certain disease-producing organisms within the bowel, which rapidly overwhelm the calf, the diarrhoea being produced by the irritant action of the germs and their products on the bowel wall. Once this condition becomes established, thousands of the bacteria with increased virulence are poured out in the foetid droppings, and rapidly infect other calves. The disease can arise through two faults in management.

1. Improper feeding leading to a digestive upset enabling the bacteria to become established. The bacteria are present in the intestines of all calves, but normally are kept well in check. Should any condition such as indigestion, due for instance to overfeeding arise, the bacteria begin to multiply, increase in virulence, and establish themselves as disease-producing organisms.

2. The feeding of contaminated milk, whereby the organisms are poured into the calf's stomach with the food. The latter fault is inexcusable—absolute cleanliness in food and utensils is of paramount importance.

Treatment

Treatment and prevention involve the same principles, and are intimately related to the management and feeding. Both nutritional and bacterial scours are responsible for heavy losses both by way of fatalities and the fact that surviving calves are frequently sickly and unthrifty, and hence a knowledge of treatment and prevention is essential.

The first essential in treatment is the elimination of the factors concerned. A careful study of the dietetic influence in an epidemic of scours shows that consideration for this alone will aid largely in checking disease where other efforts fail. In cases with contaminated food, if the unhygienic conditions underlying are continued, it is only a matter of time when heavy losses will occur.

To prevent or treat nutritional scour arising from over-feeding it is essential to reduce the amount of milk fed at any one feed, and hence feed three times a day for the first three weeks. In the first place, the calf should be fed for the first 4 or 5 days on the colostrum or first milk from the dam. For the first week, feed 2 pints of milk per feed, i.e., 6 pints per day; in the second week increase to 2½ pints per feed, and in the third week to 3 pints. It is a wise plan in prevention to add about ½ pint of water to each feed of milk. Feed whole milk for the first fortnight, and at the end of the second to third week the change to separated milk may be begun and completed

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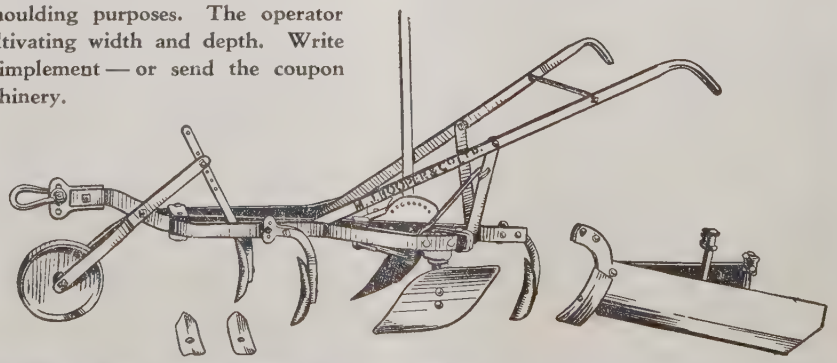

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within one week further. Feed then at the rate of one gallon per 100 lb. live weight.

Should scour develop for any reason, treat immediately by giving a dose of castor oil, 1 to 2 ounces in warm water according to the age of the calf, and the following feed allow only warm water which has been previously boiled, then allow only half the normal quantity of milk (making up the volume with water) for a few days until the condition has cleared.

Red-Water

In the dairying districts, particularly of the South Auckland and Taranaki areas, a certain number of calves die each spring from this complaint. So-called dietetic red-water occurs in cows before and after calving, and is usually associated with the feeding of excessive quantities of roots, or with the spring flush of grass, unbalanced by hay or other supplement. It is probable that in calves also diet is responsible. Some work done in Australia suggested that a certain type of bacterial infection was to blame, but this has not been confirmed elsewhere.

The occurrence of red-water in certain animals during the facial eczema epidemic of 1938 autumn would indicate that in grass at a certain state of growth there may be a substance capable of breaking down the red-cells of the blood. In red-water of any type the red-cells of the blood are broken down somewhere in the body, and the red colouring matter is got rid of through the kidneys in the urine.

Calves may die at any age from one week, which is exceptional, up to six or eight weeks. Unless a post-mortem examination is made, it is quite possible for several calves to die rather suddenly without the cause being suspected. If they are under close supervision, the passage of discoloured urine, which may vary from bright red to port-wine or almost black colour, may be noticed, and give a clue to the trouble. The conditions under which deaths occur have usually been that calves are doing well, are being well fed, on whole or on skim-milk (there seems no record of its occurrence in whey-fed calves), are getting some meal concentrate, and have access to a grazing of rapidly-growing type. Deaths may occur under other conditions, however, and in the absence of green feed, e.g. very young calves. It is possible that the harmful substance is being eliminated by the cows in the milk itself. Some have considered that dirty, insanitary conditions were to blame, but the conditions may be good.

Symptoms

In most cases the affected calf continues to take its food. Within 24 to 48 hours of the onset it becomes weak, and staggery, and the lining membranes of the eyelids, nostrils, and mouth become pale. Breathing may be laboured. Changes in the urine occur. Death in most cases takes place in one to three days. On post-mortem examination of a dead calf any urine found in the bladder will be characteristically dark red, the kidneys are usually very dark, particularly on the surface, and sometimes swollen, and the liver, on cutting into, is of a yellowish colour.

Treatment

Various treatments have been tried, with varying success. Much depends on early recognition of the trouble. The best results have been from the following procedure. Carefully give a drench of 1 tablespoonful of common salt and 1 dessertspoonful of vegetable turpentine, thoroughly dissolved in 6 ounces of milk; withhold milk for 24 hours, allowing frequent drinks of barley-water or oatmeal-water. Bring back on to milk gradually, first half water, increasing the percentage of milk daily. Keep calf warm and comfortable, and restrict exercise.

Another treatment which gave strikingly good results in some cases, and failed in others, was the giving of teaspoonful-doses of sulphate of iron in a drench. Citrate of iron and ammonia, 1 ounce doses of 6 per cent. solution, has also been tried and is a useful tonic in the anaemia caused by red-water.

Control

Preventive measures are important, since the death-rate may vary from one or two calves up to twenty or thirty in severe outbreaks. Where cases occur, grazing should be curtailed for a week or two, and a ration of good hay allowed, if calves are old enough. The milk should be properly rationed, and fed in separate buckets. A level teaspoonful of common salt should be added to each feed for a week or so. Keep a close watch on all calves to detect early cases.

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Production of Lucerne Seed in Marlborough

Lucerne has always been regarded as an uncertain crop to save for seed even on seeding-saving areas. While the seed crop is relatively unimportant in New Zealand's economy discussion on the subject seldom fails to evoke interest if only because of the fact that it may lead to the understanding of a problem of long standing. This article discusses the known facts on the subject and records the general practices adopted in Marlborough.

— By —

L. W. BLACKMORE,
Instructor in Agriculture,
Blenheim.

ONE factor that stands out above all others in its influence on lucerne seed production is climate. A relatively dry climate and in particular an abundance of hot, dry, windy weather around flowering time is essential for good yields, and in these respects the Marlborough climate is eminently suitable. The soil must be sufficiently retentive of moisture to maintain a good flow of sap to fill the seed pods. Crops have been grown on a variety of soils from medium to good in quality, the relative successes of each depending mainly on soil moisture conditions, although, as will be shown later, management also plays a big part.

That the moisture reserve of a soil has an important influence on yield is shown from observations on paddocks that vary considerably in quality. On the poorest patches the growth may die off completely, on the somewhat better patches the plants may retain their leaves but lose their flowers and young pods, while on the best areas the setting of seed may be quite good. Seed produced under dry conditions is usually small in size and may contain shrivelled seed. On very good soil in well sheltered localities, such as Spring Creek, failures have been the order and attempts are now seldom made to grow seed.

Seed Growing Areas

The main seed-growing areas in Marlborough are Grassmere, Seddon, Blind River, Dillons Point, Riverlands, and Ward. Of these districts the most consistent yields are obtained at Grassmere and Ward, which average about 1½ bags of seed per acre, while 2 and 3 bags are not uncommon. Yields as high as 4 bags per acre have been obtained. Some good yields are also obtained at Blind River, but these vary considerably, while Seddon, Dillons Point, and Riverlands average little more than ½ bag to the acre. It is thought that the consistently good yields at Grassmere are due to the presence of a layer of papa within 4 to 5 feet of the surface and that seepage from a lake in the valley finds its way to the lucerne areas along the top of this impervious layer.

Management

Age of Stand.—Apart from the fact that the yields from crops shut up for seed in the first year would be low, the stand at this stage is not sufficiently well established, and may suffer a permanent check while weeds are troublesome. Lucerne in Marlborough establishes quickly and it is usual to save seed from the second year onwards. The yields in the second year are generally small, but given suitable conditions from the third year onwards the stand is at its best. Under normal conditions a stand may be expected to last about eight years.

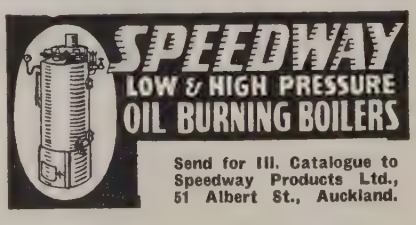
On the richer class of land where a dense growth comes away after closing up and second growth is likely to give trouble, it is considered that an old stand which has thinned out and has lost some of its vigour offers the best chance of success. Such stands do not produce so dense a bulk of leafage, which is detrimental to good seed setting, and are less prone to second growth troubles.

Time of Closing Up.—The usual practice is to graze in the spring and then take one or two crops of hay—depending on the soil and season—or else graze until the time of closing up, which takes place any time from early November to the end of December. On the lighter soils which dry out badly lucerne is often shut up too late to give the stand a chance of producing a good seed crop. The reason for this is that when feed is in short supply—as is the case more often than not at this time of the year—the stock are kept on until late into the season. Stands grazed hard and late in this manner usually come away very thin and weakly and are likely to suffer severely if the weather is dry. They are also more subject to second growth if a wet spell is experienced after flowering. It is not uncommon for the second growth to flower and set seed.

Late shutting up on this class of country also accentuates any light patches in the soil and these often fail to produce seed. Looking at the problem purely from the seed point of view there is little doubt that higher yields could be obtained if the following procedure were observed:—Close to stock from late autumn onwards and take only one crop of hay in the spring, or alternatively, graze lightly until mid-October or early November and then shut up. Such treatment would encourage a denser growth to come away and the plants would be better fitted to nourish the pods.

It is the usual practice to top the stand with a mower after removing the stock and prior to closing up for seed. This is a good practice as it makes for more even setting of seed, which is desirable from the harvesting point of view. If lucerne is shut up too late the green pod stage of development may coincide with the first frosts and injury occur. Also harvesting conditions would not be of the best.

There is also another factor of importance with regard to the time of closing up. Lucerne flowers formed before December or after January, in the Awatere County at least, seldom secrete nectar and therefore do not attract bees. These insects play an im-



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portant part in bringing about cross-pollination, which is essential for good yields.

Topdressing.—There has been a definite falling off in seed yields in the Awatere County over the past fifteen years, and it is the general opinion that this is due to drier seasons and in particular to the lack of good soaking winter rains.

However, there is evidence to suggest that soil impoverishment may also be a factor. Inquiries reveal that the great majority of lucerne stands saved for seed have either not been topdressed at all in the past or only very lightly. The lucerne plant is a very gross feeder and responds well to topdressing and particularly to lime. When it is realised that a 4-ton crop of lucerne hay removes the equivalent of about 1½ cwt. of superphosphate and 1 cwt. of lime from the soil, and that over a period of ten years this would amount to 15 cwt. of super and 10 cwt. of lime, the importance of topdressing becomes apparent. So far as the lime is concerned the amount taken from the soil by the plant is not an indication of the amount that should be put back. Firstly, lime is most important as a soil improver and secondly, considerable quantities of this mineral are lost in drainage.

A further point suggesting that soil impoverishment may be a factor is that in most cases in the Awatere County lucerne will not establish well after lucerne and 3 or 4 crops have to be grown before the soil adjusts itself and lucerne will take again.

Setting of Seed

Of our usual farm crops saved for seed there is no plant which under most conditions is more unpredictable in yield than lucerne. A stand may up to the time of flowering be very promising and yet when the time comes may not be worth harvesting. Those who have had experience with the saving of lucerne for seed know that continued hot, dry, and windy weather around flowering time is conducive to good yields. The reason for this is not generally known.

Before a lucerne flower can become fertilised it must trip. The stamens which carry the pollen and the pistil, which receives pollen, are held firmly in a boat-like structure known as the keel at the bottom of the flower. If the point of a pencil is pushed into the throat of a flower pressure is brought to bear on the keel, which splits along the centre, the stamens and pistil being forcibly released and pollination results. This tripping process is quite fascinating to watch and once seen is not forgotten.

There are several agents responsible for tripping. They are dry heat, wind, and bees. The extent to which these

operate determines the amount of seed set.

A good-sized seed pod may have a four-ringed spiral and contain eight or nine seeds. However, the number of spirals may vary from one to four and the number of seeds from one to eight or nine. The cause of a low number of seeds in a pod is apparently due mainly to what is known as self-fertilisation, i.e., when a flower is fertilised by its own pollen or pollen from another flower on the same plant. Self-fertilisation also usually results in lowered vigour in the plants grown from the seed so produced. Where pollen from the flower of one plant fertilises a flower on some other plant cross-pollination is said to have taken place. This usually results in full pods, and the seed produces more vigorous plants.

The ordinary honey bee, although so active in extracting nectar from lucerne, only occasionally effects tripping and then only incidentally when climbing over the flowers in search of nectar. While the honey bee does very little actual tripping of the flowers, it does play a very important part in ensuring good seed setting by carrying pollen from flower to flower. These bees become covered with pollen which adheres to their hairy bodies when brushing against tripped flowers, and this pollen is distributed to other flowers, and may be a means of cross-fertilisation when such flowers are later tripped. A certain species of bumble bee (*Bombus terrestris*—large bee with three white to golden bands on the body) is a very effective tripping agent and at the same time ensures cross-pollination. However, the number of bumble bees is relatively small in the seed areas of Marlborough and some of these at least are of the wrong species, so that there seems little doubt that the proportion of flowers tripped by these bees is relatively low. This is supported by the fact that in some localities such as Spring Creek, where flowering is profuse, very little seed is set.

That heat (or perhaps temperature variation) will cause tripping can be spectacularly demonstrated by placing a lighted cigarette close up to a flower. If the weather is windy as well as hot and dry tripping is further increased as a result of the beating of plants one against the other. It seems that most of the tripping in the Marlborough seed areas is due to these causes.

There are other agents at work in assisting with cross-pollination. These are the wind, and to some extent the flowers themselves which, when they trip, eject pollen into the air.

Those who have carefully observed stands in bloom on rich land in certain localities, such as Spring Creek, say that very little tripping takes place, with the result that most of the flowers drop off. This results in a flush of second growth which comes up through the stand and makes what seed may have set not worth harvesting. At Grovetown, however, good and consistent yields of lucerne seed—averaging from 1½ to 5 bags per acre—have been obtained from an area exposed to the full force of the prevailing winds and on land that is considered every bit as good as that at Spring Creek. On the exposed stands little trouble is experienced with second growth as the good setting of seed diverts the sap from leaf to seed production.

The Spring Creek district is extremely well sheltered by trees, to some extent by the low-lying nature of the country, and by hedge-bordered paddocks. The land is naturally damp and has abundant moisture reserves and lucerne usually produces a dense top growth which is inclined to smother many flowers. All this and the shady, humid conditions under which the flowers develop are probably conducive to the production of a soft, flabby type of flower in contrast with a firm, tense flower in a wind-exposed district where plenty of air gets around the plants and tones up the flowers.

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flowering plants, especially in a sheltered locality, for good seed setting is suggested by a farmer's recent experience at Spring Creek. A lucerne stand was ploughed up in the winter, worked down and sown in peas in the spring. After the peas were cut in early January the lucerne came away again and was allowed to run to seed. There was a good setting of seed—considerably better than ever before seen in the district. The stand, of course, was very thin, and there was probably no more than one plant per square foot. Another factor that may have operated was the check given to the plants as a result of ploughing.

Artificial Tripping

Is artificial tripping on a field scale practicable? Lucerne flowers can be artificially tripped by rolling them between the fingers and in small trials carried out at the Agronomy Division in covered cages specially designed to exclude bees, hand-tripped plants produced considerably more seed than those which were not tripped. Many farmers claim that they have noticed a better setting of seed in those parts of a stand where sheep have gained entrance at flowering time and have been driven out. Apparently the explanation of this is that the action of the sheep in moving through the lucerne results in the tripping of flowers.

The question naturally arises as to whether some implement could be devised to bring about tripping on a field scale. Various attempts have been made in the past but with little success.

An experiment carried out this season by Mr. R. Holdaway, of Dillons Point, is worth recording. This farmer rolled portion of his lucerne stand when in full bloom with a wooden roller and is convinced that a better setting of seed resulted on the rolled area. However, certain disadvantages cannot be overlooked. After rolling much of the lucerne did not come up, while he considers that a certain amount of damage was done to the growth. Although the difficulty of cutting could largely be overcome by rolling round and round and mowing in the opposite direction, any second growth that should come through may prove serious. Mr. Holdaway intends to try out a tedder next season.

Mechanical tripping is still very much in the experimental stage and whether or not it can give worthwhile results remains to be seen. No doubt it would be far better to leave tripping to the weather when this is at all favourable. Unfavourable weather may be followed by good weather at the last moment and a reasonably good setting of seed may result. Artificial tripping would in dull and cold weather probably be inclined to result in self-fertilisation because these conditions would be unfavourable to cross-pollination by wind and bees. The circumstances under which the process would probably offer most chance of success are hot and dry but relatively calm conditions, due either to lack of winds of any force or to the sheltered nature of a locality. Under these conditions the activities of bees would not be restricted and this would

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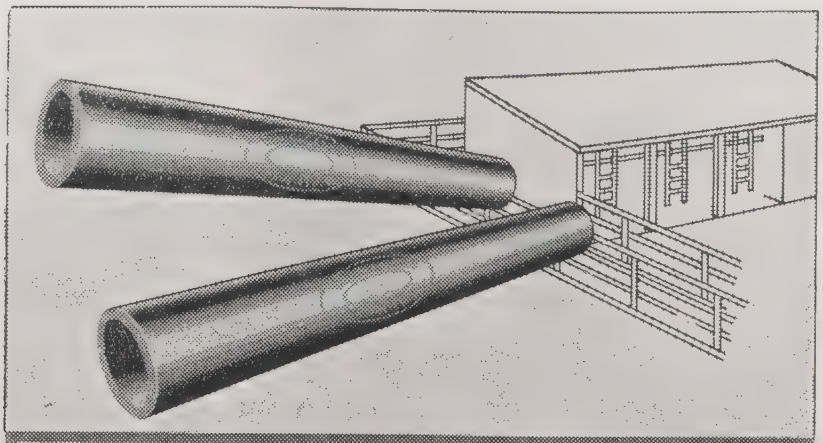

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Harvesting the Seed

The most common method of harvesting the crop in Marlborough in the past has been to cut with the side-delivery mower and thresh out of the swath or windrow by sweeping to the mill. However, with the advent of the header machine, it has become usual to use the pick-up attachment, while the direct heading method is often used when conditions are favourable.

Harvesting in Marlborough usually takes place in March or April. No hard and fast rule can be given as to the best stage at which to cut lucerne for seed as so much depends on circumstances. The crop ripens unevenly and the main object is to harvest the maximum quantity of good-quality seed. If the stand is cut too early a good deal of shrivelled seed will result. The seed normally does not shake readily and if conditions are favourable it is better to err on the late side rather than on the early side. However, most seed growers prefer to cut before the seed is dead ripe as a brighter and more attractive sample is obtained. It is usually considered safe to cut when the top pods are turning yellow, or where the stand is ripening unevenly, when the bulk of the pods are past the green stage. When these stages have been reached usually well over half of the pods are black or brown.

If the crop is to be headed it must be left until the seed is dead ripe. Direct heading can be done only under the most favourable conditions. The presence of second growth or unripe seed makes a stand unfit for heading, but a certain amount of green leaf on the seed stem can be dealt with.

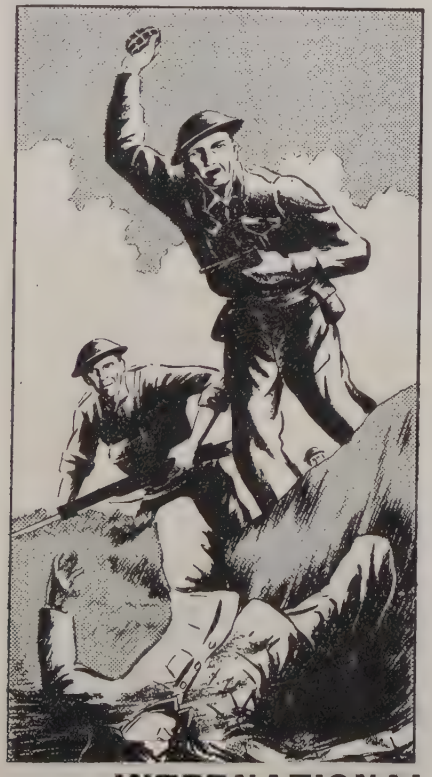
Wireworm Damage in Potatoes

WIREWORM damage is easily recognisable, consisting in bad cases of a dozen or so small circular holes of perhaps one-tenth inch diameter, dispersed over the tuber surface. The tuber when cut open shows a series of passages or tunnels with blackened walls. In table potatoes much wastage occurs in cutting away this unsightly material prior to cooking. Tubers badly affected are well-nigh unusable, let alone saleable. Mild attacks render table potatoes unattractive, but slightly-attacked tubers can be used quite safely for seed purposes.

The cause of the damage is the larval form of the click-beetle (*Agriotes spp.*) which, in the case of an individual, may occupy from three to five years of the entire life-cycle before it pupates prior to emerging as a beetle. Thus the attacking stage of each larva may last for a period of three to five years The larva is half to one inch long, with a hard, shiny, greyish-black coat with transverse bands of a lighter colour. In freshly-dug new potatoes it may be seen projecting out of a tunnel in the tuber, and is quite difficult to draw out.

Practical control lies in prolonged cultivation. Attacks are most commonly to be feared when old pasture is broken up, particularly the old, tufty, matted type. On such ground where infestation occurs it may be expected to remain for three to five years after ploughing or digging and cultivation, the population, however, constantly decreasing. It is therefore not advisable to grow potatoes on this land until after three years cropping, when the wireworms can be expected to have decreased to such an extent that no widespread damage from them should eventuate.

—K. COTTIER, Assistant Instructor in Agriculture, Invercargill.



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Hitler sneered when he said in the early days of the war, "These New Zealanders, these poor country lads." But Rommel knows what country lads are made of; Rommel understands only too well why Churchill named the New Zealand Division "that ball of fire."

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Veterinary Notes for the Farmer

Vaccination Against Contagious Ecthyma

CONTAGIOUS ECTHYMA has a wide distribution. It occurs in New Zealand and in many other parts of the world—Australia, South Africa, America, and England—and in these countries it has been studied by several investigators. In New Zealand the mortality from the disease is negligible, but the symptoms are alarming when first discovered, and affected sheep lose condition and suffer a pronounced setback, the severity of which is governed by the virulence of the outbreak and the extent of the lesions—that is, the degree of injury—on the mouth.

The term "Ecthyma" means an inflammatory skin disease attended with an eruption of superficial pustules of varying size. The disease affects both sheep and goats, but in this country we are really concerned only with its appearance in sheep. It is characterised in sheep by an eruption about the mouth, and the infection may also be conveyed to the udders and teats of the ewes.

First Symptoms

The first symptoms usually noted are a swelling of the lips, with the development of more or less warty, moist scabs. This swelling of the lips gives the affected animal a distinctive appearance, which is readily noticed. Actually, the eruption at first is red and papular, then vesicular, and subsequently scabby. The scabs are brownish-grey in colour, and are moist in the early stages; later they dry out, becoming hard and very often cracked. The rapidity of spread through a mob of sheep leaves no doubt as to the infectious nature of the disease.

As farmers who have experienced outbreaks of this disease will remember, it is one primarily affecting young sheep—lambs and hoggets. Older animals may sometimes contract the disease, but in them the infection is usually of a milder type. It has been recorded that a mild infection can sometimes occur in man. In natural outbreaks the lesions of contagious ecthyma are confined in the lips and udder, indicating that the infection is a localised affair resulting from direct infection of the affected area. There is no doubt that the udder lesions sometimes seen in ewes are the result of direct infection by the lips of the lamb during sucking.

Virus Disease

Contagious ecthyma is a virus disease, and is due to a specific filterable virus. A virus is some type of infecting agent which is beyond the limit of visibility—that is, it is too small to be seen by the highest powers of the microscope. The generally accepted hypothesis regarding the general nature of viruses is that they are independent living micro-organisms. Such knowledge as has already been gained of virus diseases is of comparatively recent origin, and it is interesting to record that the virus of foot-and-mouth disease was demonstrated in 1898. This was the first human or animal disease shown to be due to an infective agent beyond the limit of visibility.

Many viruses, of which the virus of contagious ecthyma is one, can pass through the minute pores of special bacterial filters, and this is why they are termed filter-passing or filterable viruses. The term specific in the case of the virus of contagious ecthyma is used to indicate that this virus always produces the same disease and no other in susceptible animals.

There are, of course, many virus diseases, each with its own particular virus to account for it, in both plants and animals. A few examples are mosaic disease of potatoes, tomatoes, and cucumbers, acute poliomyelitis (more popularly known as infantile paralysis), mumps, smallpox, measles, common colds, cowpox, and distemper in dogs.

The virus of contagious ecthyma is highly resistant to destruction and may be preserved in the scabs on the ground for very long periods. This no doubt accounts for the recurrence of the disease on a farm after an absence of two or three years or even longer.

Infection

The commencing infection in an outbreak is, in all probability, picked up from virulent scabs in a paddock, but the rapidity of spread afterwards would indicate that direct contact of healthy and infected sheep is a factor. Skin injury is not always essential for the entry of the virus, but frequently there

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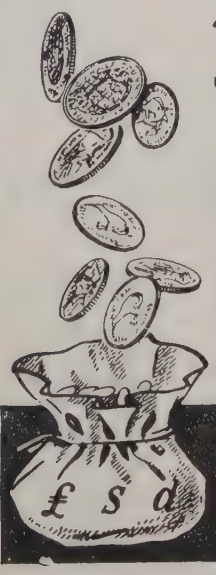

A timely application of
JOSEPH FORD'S FOOT-ROT DRESSING
When Foot-Rot — a chronic, infectious, ulcerative disease—appears in your flock, immediate steps should be taken for its control. Once the disease has developed it may spread rapidly, causing havoc amongst your flock. If your sheep are worth keeping they are worth keeping well. Use Jos. Ford's Foot-Rot Dressing, the liquid antiseptic for individual treatment. Economical and effective.
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JOSEPH FORD'S FOOT-ROT DRESSING

is some slight irritation about the lips, especially when one considers that sheep are often grazing where there is scrub, gorse, thistle, or stubble. There are occasions where grazing under such conditions as these, a benign irritation is produced in the vicinity of the mouth which is not dependent on the existence of the virus.

Contagious ecthyma in New Zealand occurs from time to time in the spring, summer, and autumn months. The uncomplicated case runs a course of about one month from the time of the appearance of the first lesion until the scab drops off. The lesions heal spontaneously, leaving the lips smooth and without scars.

Medicinal treatment for this disease is not particularly satisfactory, but some benefit may be derived by cleaning the areas involved in badly-affected animals and applying a preparation made by a mixture of one part of tincture of iodine to two parts of glycerine. Honey and boracic acid makes a suitable ointment. Repeated applications of the selected treatment are indicated.

There is, however, a method of prevention by vaccination which is practical in use and justifiable from an expenditure point of view, and can be used in those areas where contagious ecthyma is frequently observed.

Vaccination Method

The vaccination method is employed with success in America, and more than a million doses are used annually in the State of Texas. The Chief of the Division of Veterinary Science at the Texas Agricultural Experiment Station states that farmers there declare that they would not be without the vaccine, because it saves so many lambs not only from direct losses from sore mouth, but many more from screw-worm attack in case the animals contract sore mouth. Fortunately, the fly responsible for screw-worm does not exist in New Zealand.

Inoculation of susceptible animals with properly-prepared material from the lip lesions induces the formation of a benign local lesion which sets up a definite solid immunity that endures for at least eight months or even longer. A desiccated scab emulsion is prepared in New Zealand at the laboratory of the Department of Agriculture, and this has been used with success in various parts of the Dominion.

The technique of vaccination is analogous to that of smallpox vaccination in the human subject. It is comparatively simple, and can be conveniently carried out on lambs at marking-time.

A small area of skin inside the flank is cleaned and the skin stretched with the fingers and thumb of one hand; then several superficial scratches about ¼in. long are made with a scarifying instrument. One drop of vaccine is thoroughly rubbed into the scarified area with a small stiff-bristled brush. It is necessary to emphasise that the skin should be lightly scarified, only the superficial layer being broken through; it is neither necessary nor desirable to draw blood. The areas scarified must not be large, and the amount of vaccine limited to one drop or so, otherwise the resultant "takes" will be unnecessarily severe. About the fourth or fifth day after vaccination there is evidence of reaction at the site of vaccination.

—H W. CARBURY, M.R.C.V.S., Veterinarian, Auckland.

10 months old . . . 105 guineas

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Dear Sirs, Inglewood, 16/6/43.

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Yours faithfully,
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Answers to Correspondents

Horse with "Itchy Heels"

"D.M.P.," (OPOTIKI):—

I have a draught gelding rising seven years of age. He was handfed as a foal and drinks skim milk and eats scraps of vegetables which have been thrown in the paddock. For a little over a year he has been stamping his hind feet and rubbing his hind quarters against anything he can lean up against. He does this at intervals all through the day and night. His condition is good, and he is handfed occasionally on maize and chaff. When he first took bad I went to the veterinarian who said it was worms and gave me a prescription and advised syringing him with a handful of salt

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

in a little raw oil. The prescription contained oil. I gave him the medicine about six times in all but did not syringe him at that time. The medicine did not appear to do him any good. For a week I have syringed him once a day with oil and salt. It has not made any difference. He still stamps as much as ever. I prefer syringing him as it is very difficult to make him swallow the medicine. I would be very grateful if you could tell me what is wrong with him and how to cure him. A mare the same age running with him is not affected.

LIVESTOCK DIVISION:—

The condition affecting your horse is fairly common and is known as "itchy heels." The skin of the back part of the legs from the coronet half way up the cannon bone becomes dry, cracked, scurfy and very itchy.

This trouble is attributed to a variety of conditions. It is seen under excessively dry and dusty conditions, as also under wet and muddy ones, especially where the mud is washed into the skin or when drinking from muddy drains by hose pipe, rain, by fording creeks, or pools. Some horses especially those with thick, gummy legs, appear to be more predisposed than others. Horses in gross condition from overfeeding and those in a dilapidated state following illness are also subject to this trouble.

In your particular case it would be advisable to give your horse a purgative dose of medicine. Six drachms of freshly powdered Barbadoes Aloes dissolved in two pints of very hot water and given when cool would be suitable.

Discontinue the feeding of milk and tit-bits. The *occasional* feeding of maized chaff is not recommended; any sudden changes in feeding are not tolerated well by horses. Any changes should be made gradually and continued for some time if any beneficial effects are desired. Salt should always be available either as a lick or by dissolving in water and sprinkling over hay. A horse requires about one ounce of salt a day.

The affected parts should be thorougly cleaned with a dandy brush and a curry comb if necessary. The following mixture should then be applied twice or three times weekly as found necessary—one ounce of creosote in one pint of raw linseed oil. Precautions should be taken to keep the legs as free from dust and dirt contamination as possible.

Fattening Lambs

"J.S.M." (D'Urville Island):—

This farm is situated on the farthest north point of D'Urville Island, and has no shelter from all the winds that blow. In my time of farming here I can't fatten the lambs on the mothers. I think I can definitely say there is no local farm with such easy country or as much English grass such as rye and clover, etc. The ewes get well conditioned and grow the lambs very well but just don't finish them. The country is not over stocked, and it is quite evident the hoggets have worms. I dose them for that, but not till after weaning, and then periodically right through the winter, but I have thought of dosing the lambs about November and seeing if that would help them, do you consider this advisable?

LIVESTOCK DIVISION:—

I would recommend dosing your lambs about November and at three-weekly intervals until weaning with the bluestone drench made up in similar quantity to the bluestone-nicotine mixture, but without the latter, which should be added to the drench after weaning. The drench is made up with 3 ounces of bluestone to 1 gallon of water, and the dosage for young lambs not more than half an ounce. This should overcome any parasitic infection and avoid setbacks, but it is possible that there may be a deficiency of some mineral element such as cobalt which delays "topping off" the lambs. If you could forward the liver of a lamb direct to the Chief Chemist, Department of Agriculture, Sydney Street West, Wellington, tests as to cobalt content could be made and you will be advised acordingly. You would be wise to send the specimen, well wrapped, in the early part of the week and by the shortest route, enclosing a note giving your name and address, and stating that the specimen is for cobalt analysis.

INSURANCE AGAINST WORMS

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per 100 LAMBS

You always take the wise precaution of insuring your farm buildings and equipment. Isn't it sound commonsense to ensure the HEALTH of your sheep? These tried and tested drenches, constantly used by thousands of New Zealand farmers, provide low-cost protection against all of the more common worm infestations.

GIESEN'S (Carbon Tetrachloride) Sheep Drench gives protection against stomach, bloodsucking intestinal worms and Liver Fluke, and costs only

5/8 per 100 sheep

2/10 per 100 lambs

SUTTON'S (Nicotine Bluestone Cobalt) Drench gives protection against small intestinal hair worms, and tape worms, and costs only from—

1/5 per 100 young lambs

5/10 per 100 fully grown sheep.

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Middle Ear Disease in Pig

"J.L." (Kairanga):—

I would be pleased if you could assist me in the ailment of a pig. This pig, about 5 months and in good condition, became very unsteady and staggery on the feet about four weeks ago, and walked with head on one side. I do not think it is "Middle Ear" as explained in your Journal for December, 1941, as the animal is in too good condition, and has never had any setbacks. It got to the state that it had much trouble to get on to its feet and would roll over or fall when walking although it always had good appetite.

I put it in a warm house and fed as usual and kept confined for 10 days, giving one dose Epsom salts. I now let it run out in good grass paddock and shut up overnight. Although it can walk quite well it still holds its head partly to the right side and when walking any distance will sometimes stop and turn completely around, as though not sure of its bearings. It is going ahead in condition as are its mates elsewhere. Food consists of meal mixed with hot water and 50 per cent. skim milk. (I intend getting some cod-liver oil and give a little each day in feed.) It has also had clean grass run with good dry housing and not over-crowded to get chilled.

LIVESTOCK DIVISION:—

Middle ear disease, as described in the December, 1941, issue of this Journal is certainly by far the most common cause of this symptom. As you say, however, it is most often seen in unthrifty pigs kept under bad conditions, and more particularly without access to some food containing vitamin A., such as young green grass, butterfat, codliver oil. It is possible, however, to have it in a pig apparently thriving, at least up to a point, and much would depend on the state of the grass run provided. You should certainly try the cod-liver oil, and one would expect improvement after a week or two if middle ear disease has been the cause, and damage has not proceeded too far.

Other possible causes are a hydatid cyst of the brain, or a tuberculous lesion of the brain, but these are comparatively rare and not amenable to treatment.

Cow Unable to Rise

"H.M.B." (Greytown):—

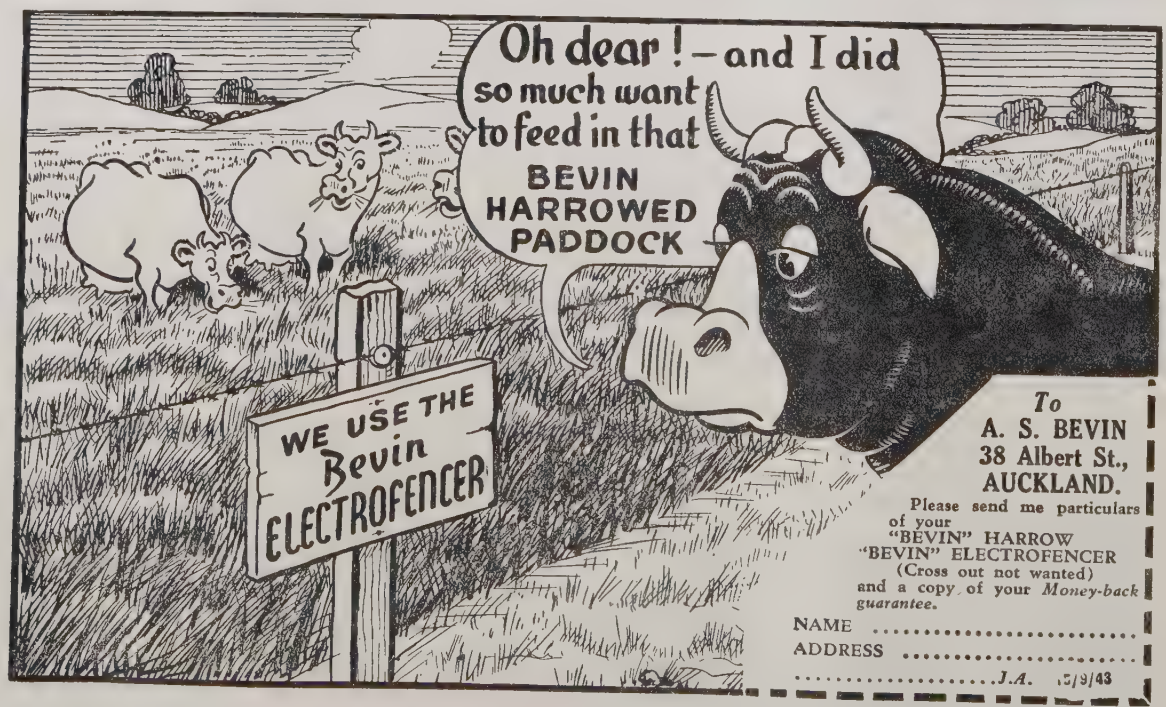
The cow that is causing me trouble is an aged cow whose teeth are worn to stumps. She is one of our best cows while there is plenty of feed. At present she is heavy in calf, due to calve shortly, and as cows are so dear to buy I want to save her, if possible, especially as she is so well and healthy, all except her legs, which will not support her. She just sits and eats and drinks all we give her, but she will not get up. I have already given her several stimulant tonic powders, and yesterday I gave her an injection for paralysis and milk-fever, but all to no avail. I believe that in the first instance I might have been responsible for her condition, as I was unaware of the condition of her teeth, and I should have given her more food than she got, as feed has been very scarce during the past few months. However, she has been down for a week now, during which time I have given her all the hay and cut grass she can eat. I would therefore be very pleased of your advice; if you could give it to me soon."

LIVESTOCK DIVISION:—

You do not mention the condition of the cow. If she is in a debilitated condition it is rather doubtful if you will be able to keep her going, or even if she will survive calving.

However, there is a type of paralysis, the cause of which is not clearly known, in which a cow, in quite good condition, will be unable to rise, perhaps for a period of two or three weeks before calving, but otherwise appears healthy, eats, and chews the cud. In such cases it is advisable to have plenty of bedding under the animal to prevent sores on hocks and elbows, and to turn her from side to side two or three times a day, if she is unable to turn herself. Two or three doses of 2lb. to 3lb. molasses is very useful, one dose a day, thinned with a little warm water, or if you cannot obtain it, a similar amount of sugar made into syrup, or a free supply of gruel made from flour. I should continue the stimulant powders, and give the cow any type of food that she takes willingly.

However, you would have to be prepared for a fairly long period of nursing as while such a case might get up at any time she may remain down till she calves.



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Farm Practice and Management

Lucerne and Cocksfoot as a Mixture

Experience in Central Otago

THE common practice of utilising lucerne has been to sow pure stands which, in the main, have been used for haying. With the more extended use of lucerne in some districts some reliance has been placed on it for grazing as well as for hay crops. Its utilisation as a grazing proposition brings up an important feature; should it be sown pure or in mixtures, and if in mixtures what would be a suitable combination?

On the lighter land on the low rainfall areas lucerne is finding very ready favour as a grazing plant. Large paddocks are being sown out, some for the sole purpose of grazing, others with the intention of taking one or two cuts for hay and grazing the later growth from then on. In an article in the August, 1941, issue of this Journal the factors controlling the grazing of lucerne were discussed. It was stated there that one of the main features governing the grazing of lucerne was surface competition from other plants which are not grazed so readily, which recover more quickly after grazing, which will stand more tramping by stock, or which will withstand closer grazing than will lucerne. Therefore, if a pasture grass is to be selected to combine with lucerne it must have none of these disadvantages. It was for this reason that cocksfoot was selected as a plant that might thrive in combination with lucerne under grazing conditions.

Satisfactory Results

This combination has been used by several farmers in Central Otago with very satisfactory results. The results obtained are sufficient to recommend the use of this mixture on a very much more extensive scale. The mixture is not recommended on the heavy first-class lucerne country where it should be sown pure, but is for use on light, dry, extensive farming areas which will grow little else.

The sowing on these areas should be at the rate of about 5-6lb. lucerne and 8-12lb. cocksfoot per acre. Where the conditions for favourable establishment of the lucerne are more difficult the rate of seeding should be increased to as much as 12lb. per acre.

The factors underlying the success of this combination are:—Cocksfoot is not aggressive; it is a shade-loving plant, and withstands dry surface conditions; its tufted nature allows it to combine well with lucerne, occupying as it will the bare spaces between the lucerne plants. By using it with lucerne the annual weeds such as hair grass, sorrel, and goose grass are suppressed. Cocksfoot flourishes under haying, so that if the early growth of lucerne is cut for hay the cocksfoot which will grow during the dry summer months will have an excellent chance to balance the later grazing from the area.

Management

In establishing such a combination the early management must be careful. Cocksfoot is slow to establish, and in general must be carefully grazed for the first year or two. Where lucerne is grown on light land which is not holding much moisture it also is slow to establish and needs careful treatment. It must be seen, therefore, that neither the cooksfoot nor the lucerne should be mismanaged in its early stages.

This combination is a good one, and, to obtain balanced and profitable grazing from spring to late summer, is worthy of further consideration on many of the light soils of Central Otago, and could be attempted profitably elsewhere.

—W. R. LOBB, Instructor in Agriculture, Dunedin.

Distributors in Dunedin and Invercargill: EADIE BROS., LTD.

Easing Drain Maintenance Work

EVERY farmer knows only too well the amount of time and labour involved in keeping a length of open drain in good working order, even where it runs in a straight line and is properly graded. Where the drain in question is a kind of miniature, ungraded, winding creek, this trouble is intensified, particularly as the growth of aquatic vegetation constantly results in the silting and blocking of the water channel.

Realising that the work of maintenance under such conditions promised to be both recurring and endless, a Matakana farmer, Mr. D. W. Meiklejohn, sought for an easier way, and is now confident that he has found it.

Observing that the watercourse remained free and unimpeded without attention wherever the creek was shaded by a patch of bush, he decided that equally good results could be expected from the planting of a few rows of dense shade-producing trees along the banks.

Choice of Tree

Appreciating that the success of the project would depend very largely on the selection of the species of tree planted, Mr. Meiklejohn gave the matter very careful thought. Obviously he wanted a variety which would be a quick grower and which would also provide a dense, smothering shade. In this way, he would kill two birds with one stone, as the trees would provide a very valuable shelter belt for stock as well as an effective smother for vegetation along the creek. The suitability for local conditions, the ornamental value, and the ultimate value for farm timber were also taken into account. The final choice was macrocarpa.

The trees used were well-grown two-year-olds and although planted very late in the season, mortality has been surprisingly low and the majority of the trees have made excellent growth. To prevent damage from stock, the area was fenced off by means of an electric fence, and this has proved a cheap and efficient method of protection.

Several Rows Advisable

It should be noted that Mr. Meiklejohn has been careful to plant several rows of trees, and has not made the very common mistake of relying for shelter on only a single row. Where planted in a single row, the trees are very liable to open out at the bottom, particularly where the fence has been placed too close to provide proper protection against stock. Care should also be taken not to plant tall-growing trees too close to a drain, as the insufficient root hold is apt to result in the trees being blown over by high winds later in life.

Although macrocarpa is not so liable to open out at the base if allowed plenty of room and well protected from stock, its shelter value may be greatly improved, provided the land is available, by planting an outside row of lawsoniana where the ground is fairly dry, or of benthami where the ground is wetter. Needless to say, the success and value of the project will depend very largely on the wise selection of the species planted, and on their suitability for local soil and climatic conditions.

—P. S. SYME, Instructor in Ariculture, Warkworth.

ME..

Frederick William Carr (Fred for short) . . .

That's me!

Married . . . Sure, with four kids . . .

Occupation . . . Dairy Farmer . . . 80 cows.

And tired out . . . what with more production and fewer hands — a fellow's hardly got time to even eat and sleep these days . . .

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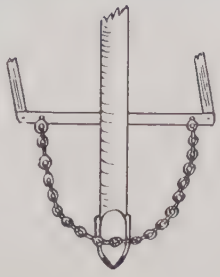
J.A. 15/9/43

Improved Method of Covering Seed Sown with Ridger

THE majority of farmers who have used a turnip ridger must have at some time or other felt that the method of covering the seed was unsatisfactory. If the soil is not well worked the chain arranged as it is at present brings too many clods into the coulter mark, and one obtains an uneven strike, even under good weather conditions. If, on the other hand, the soil is well worked, the seed is apt to be covered too deeply and again an uneven strike often occurs.

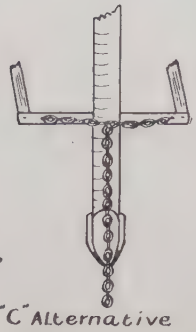
Mr. J. Stewart, Pyramid, has made an adaptation of the present method which certainly overcomes both these objections, and in addition compresses the soil in the coulter mark and gives a quicker and more even strike.

On most ridgers a chain as shown in diagram "A" is used to cover the seed. This chain is removed, and a hole to take a ¼-inch bolt is drilled through the coulter. The chain or a similar piece is now doubled and the middle link is attached to the coulter by the ¼-inch bolt previously mentioned, as in diagram "B."



"A" Usual method.

"B" Chain attached to bolt through coulter.



"C" Alternative method of attaching chain, avoiding boring of coulter.

Another method of attaching the chain, if no drilling machine is available for drilling the ¼-inch hole in the coulter, is to shorten the present chain as much as possible and to attach a short length of chain, approximately 18 inches long, to the middle link as in diagram "C."

The chain now follows the coulter mark and dislodges any large clods which might be inclined to lie on the coulter mark, and also compresses the soil and seed, ensuring a much quicker and surer germination.

—H. K. EDIE, Assistant Fields Instructor, Gore.

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Radio Broadcasts

RADIO talks to farmers will be given from Station 1YA, Auckland, at 7.15 p.m. on the following dates:—

October 4.—"October on the Farm," by Mr. P. S. Syme, Instructor in Agriculture, Department of Agriculture, Warkworth.

October 11.—"Some Problems of Soil Moisture," by Dr. Lai-Yung Li, Plant Diseases Division, Auckland.

October 18.—"Cropping for Winter Feed," by Mr. K M. Montgomery, Fields Instructor, Department of Agriculture, Te Kuiti.

October 25.—"Young Farmers' Clubs' Session"—talk to be given by Te Kuiti Young Farmers' Clubs.

Pig Industry Broadcasts

UNDER the auspices of District Pig Councils concerned broadcasts will be delivered in October as follows:—

1YA (Auckland)—October 21, 7.15 p.m.: "Weaning to Four Months," by H. H. Preston, Supervisor, Northland District Pig Council.

2ZA (Palmerston North) — October 19, 8.30 p.m.: "Common Ailments," by H. Marsdon, Supervisor, Wellington District Pig Council.

2YH (Napier)—October 14, 7.30 p.m.: "Bacon Production," by Ivan H. Owtram, Supervisor, Tairawhiti District Pig Council.

4YA (Dunedin)—October 11, 7.15 p.m.: "Equipment that makes Pig-keeping Easy," by M. Roderique, Supervisor, Otago District Pig Council.

Coccidiosis of Poultry

ONE of the most prevalent infectious diseases attacking poultry in New Zealand today is coccidiosis of poultry. In view of its widespread incidence in both islands, and a heavy mortality amongst infected birds, it is essential that poultry-keepers should be able to recognise this disease. The Department's **free** bulletin (No. 22) discusses the causes, treatment, control and preventive measures which must be taken in the event of an outbreak occurring. Write to the Department of Agriculture at Auckland, Wellington, Christchurch and Dunedin for a **free** copy of this bulletin.

Orchard Diseases

FULL information on the subject of sprays for the control of orchard diseases and pests is available in a **free** bulletin (No. 161) obtainable from the Department of Agriculture at Auckland, Wellington, Christchurch and Dunedin.

FIRST THINGS FIRST

War Priorities Regulate Train Travel

Fleets of locomotives are necessary to cope with the greatest freight volume in our history; scores of extra trains are required for troops on service and on furlough. The safe, expeditious conduct of this all-vital traffic and the maintenance of as many domestic services as may be continued without impeding war requirements, places upon the railways a responsibility too great to be hindered by passengers on pleasure bent. This is a serious time and you can help the railways most by staying at home.

Unnecessary Travel Hinders Transportation

Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the months May to July, 1943, have been compiled by the Livestock Division:—

District.	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Pigs
North Island.						
Meat-export Slaughterhouses—						
Auckland	79,103	132,904	62,063	24,697	96,627	22,954
Poverty Bay-Hawkes Bay	22,867	12,647	73,663	33,280	128,012	6,013
Taranaki-Manawatu	48,779	25,400	50,367	25,935	167,503	24,802
Wairarapa-Wellington	18,288	4,205	45,368	23,281	123,479	4,500
Totals	169,037	175,156	231,461	107,193	515,621	58,269
Abattoirs	37,544	11,024	163,850	67,615	29,592	11,431
North Island Totals	206,581	186,180	395,311	174,808	545,213	69,700
South Island.						
Meat-export Slaughterhouses—						
Nelson-Marlborough	1,400	3	7,393	4,552	38,053	2,676
Canterbury-Westland	4,681	4,577	112,876	98,547	339,027	8,514
Otago-Southland	8,740	172	68,550	56,818	569,172	1,222
Totals	14,821	4,752	188,819	159,917	946,252	12,412
Abattoirs	16,028	2,976	71,081	44,156	10,474	4,439
South Island Totals	30,849	7,728	259,900	204,073	956,726	16,851
Dominion.						
Meat-expt. Slaughterhouses	183,858	179,908	420,280	267,110	1,461,873	70,681
Abattoirs	53,572	14,000	234,931	111,771	40,066	15,870
Grand Totals	237,430	193,908	655,211	378,881	1,501,939	86,551
Same Period, 1942— Meat-export Slaughterhouses and Abattoirs	281,654	186,029	598,332	342,691	1,378,590	142,954
Same Period, 1941— Meat-export Slaughterhouses and Abattoirs	212,740	189,203	598,818	385,654	1,554,974	164,578

Slaughterings of Pigs

The 10,204 pigs slaughtered at meat-export slaughterhouses and abattoirs during the month of July, 1943, were distributed in weight ranges, approximately, as follows:—

Up to 60lb.	99
61 to 120lb.	5,130
121 to 160lb.	3,529
161 to 180lb.	593
Over 180lb.	448
Sundries	405
	10,204

The grading of porkers was 91 per cent. of 1st quality, 9 per cent. of 2nd quality, and that of baconers was 80 per cent. of prime 1's, 15 per cent. of prime 2's, and 5 per cent. of 2nd quality.

In the different weight ranges of baconers the grading was as follows:—

121-160	82%, 14%, 4% of P1's, P2's and 2nds respectively.
161-180	68%, 22%, 10% of P1's, P2's and 2nds respectively.

In the Orchard and Vineyard

Orchard Notes

Spraying Apples and Pears

SEASONAL operations in the orchard are:—

1. Spraying for the control of disease.

2. Attend to grafting.

3. Cultivation.

Any spray programme to obtain efficient control of pests and diseases must be complete, and while it may appear to be a waste of time and money to apply sprays when conditions are favourable, this is the only worth-while insurance available to the grower. In this respect it would be most interesting to have complete statistics of the actual loss in fruit and money, and to compare the loss with what it would have cost to provide an efficient programme.

Successful disease control is not the outcome of attention to any one point but is the result of the satisfactory co-ordination of all factors. Faulty application of sprays leading to inadequate coverage is one of the most frequent causes of inefficient disease control. Many a grower has blamed the spray specifics used for the poor results obtained, when the real reason may be traced to inadequate coverage. Maximum coverage without undue waste is the ideal to attain.

A factor in successful disease control is the reduction of disease "carry-over" from year to year. Inefficient spray application assists the build-up of "carry-over" and renders future disease control more difficult. The cessation of spraying too soon in the season may permit disease to build-up to a dangerous extent. Bordeaux applied in the late summer at a strength of 1—2—50 has been found effective in reducing the "carry-over" of disease in the orchard, and also in preventing storage rots in fruits.

Spray Equipment

Efficient spray equipment is a vital factor in securing satisfactory disease and pest control. Many an orchard and fruit crop has become infected because of the interruption to spray application at a critical period through break-down experienced with the spray outfit.

See that the outfit is maintained in a thorough working condition and that spray hoses are renewed where necessary. Spray hose is now becoming increasingly scarce and difficult to replace, and the following measures are recommended in order to lengthen the life of hose:—

Do not use excess pressures—300lb. at the nozzle is all that is necessary.

Avoid getting kinks or twists in the hose while spraying.

After use, coil hose carefully and store in shed out of weather. A good method is to coil hose into a half-barrel or drum. It is then out of the way and not likely to be walked on.

Do not hang hose on pegs.

By careful treatment a good hose can be made to last several seasons.

Spraying Programme

To control leaf-hopper combine nicotine sulphate at 1-800 in the petal fall or following spray.

Russet is a matter of serious concern to apple growers. It is not an easy problem to solve on account of the number of factors involved. Briefly, the principal factors which, either singly or a combination of two or more, influence russeting are:—

1 Unthrifty condition of trees due to various causes.

2. Unsuitable soil conditions, inadequate drainage, etc.

3. Unsuitable climatic conditions, including wind, frost, etc.

4. Disease: Powdery mildew.

5. Spraying: (a) application of sprays which are too caustic to newly-formed fruits;

(b) application of sprays in excess volume;

(c) retention of sprays in high liquid condition on the surface of fruits for indefinite periods (late evening applications under high

The following spray programme is given as a recommendation applicable to all parts of the Dominion with modification according to districts:—

PEARS.

Period of Application:	Treatment:	Disease or Pest:
Early green-tip	(1) Bordeaux 5-4-50	Black spot
Open cluster to pink	(2) Bordeaux 3-4-50	Black spot
Petal fall	(3) Bordeaux 3-4-50 Plus lead arsenate 1½lb.-100.	Black spot, codling moth.
Fourteen days later	Ditto	Ditto
Eighteen to twenty-one day intervals to January and later as required.	Ditto	Black spot, codling moth, leaf roller, leech.

APPLES.

Period of Application:	Treatment:	Disease or Pest:
Early green-tip	Bordeaux 5-4-50 or Lime sulphur 1-30	Black spot, powdery mildew.
Open cluster to pink	Lime sulphur 1-150	Black spot, powdery mildew.
Petal fall	Lime sulphur 1-200 Colloidal sulphur 1lb.-100 (40%) Lead arsenate 1½-100 Hydrated lime 3lb.-100	Black spot, powdery mildew, codling moth, bronze beetle, leaf roller.
Ten to fourteen days later.	Ditto	Ditto
Fourteen to eighteen day intervals to mid-December.	Ditto	Ditto
Eighteen to twenty-one day intervals to end of January and later as required.	Ditto or Bordeaux 1-2-50* Lead arsenate 1½-100 plus spreading agent.	Black spot, powdery mildew, bitter rot, ripe spot, codling moth, leaf roller.

* The alternative programme is required where Bitter Rot (*Glomerella cingulata*) is prevalent.

relative humidity are very liable to cause russeting);

(d) sprays containing gritty materials.

Grafting

Owing to changing conditions in variety and market values, some orchardists in practically every fruit-growing district are confronted with the necessity of re-working some fruit trees.

The re-working of trees by the grafting method may be undertaken as soon as the bark lifts readily. From the middle of September the trees are usually in a fit condition, and providing the scions are not in a too forward condition this work can be carried on until the end of October. It is essential that the scions be more backward in growth than the stock.

In any form of grafting the essential point is to place the scion on the stock so that the cambium layers of the two are brought into contact with each other. The cambium layer is that line or layer of cells found between the wood and the bark. This is the growing part of the tree and in this part will come the union and joining together of the stock and the scion.

The whole of the cut surface should be sealed and rendered airtight, either with a home-made grafting wax or with one of the proprietary compounds which are now available on the market. A very important point is that a re-sealing operation is usually required. A fortnight after the work has been completed, the grafts should be examined and wherever any cracks or openings are seen these should again be painted over.

Cultivation

Upon the completion of spring ploughing, the soil should be worked to a fine tilth. By careful and constant cultivation in the orchard serious infestations of the Bronze Beetle can be limited, especially when the beetles are on the wing during the months of November, December, and January.

—A. T. DOUGLAS, Acting District Supervisor, Horticulture Division, Auckland.

Citrus Notes

Pruning, Cultivation and Spraying

ON REACHING maturity New Zealand grapefruit (Poorman orange) should be harvested and large quantities should not be allowed to remain on the trees too long because of the tendency to reduce the vitality of trees and the detrimental effect this would have on the following season's crop. A heavy new crop is rarely produced on trees allowed to carry their old crops too long. A few of the slower maturing grapefruit inside the trees will do little harm, but their numbers should be small. Sweet oranges should be harvested as they become fully coloured and sweet, as some varieties deteriorate very rapidly if permitted to hang on the trees.

Pruning

With the easing of harvesting work, more time will be available for pruning, which should be pushed on to completion before December. Labour difficulties may limit pruning, but an attempt should be made to clear dead, diseased, and spent wood from the older trees, and to remove the worst of other undesirable growths. Pruning of young trees should not be neglected. Their whole productive lives are ahead of them, and formative pruning, to ensure good strong frameworks and fairly open branching systems, must be done in the earlier years of their lives to avoid the setback often suffered by trees heavily pruned a few years later.

Spraying

As the spraying season is fast approaching the equipment should receive a thorough overhaul and, where necessary, repairs effected. Leaky hose connections, taps, and joints are not welcome in the middle of spraying. Stoppages from these causes can be reduced to a minimum if the equipment receives attention beforehand. Hose ends frequently wear first. Shorten them by a few inches and get on to sound material again before the inevitable burst occurs.

Verrucosis in commercially clean orchards is usually controlled by one spring spray of the main blossoming at petal fall, about November, and where the disease may have gained a stronger hold for some reason, supplementary sprays will be necessary. A pre-blossom spray in October will prove very helpful in combatting verrucosis, or other fungus diseases which may have become somewhat out of hand. The November spray may be followed about a month later with a third Bordeaux spray for very severely

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infected trees. Isolated trees, or small blocks, may be given extra sprays without going over the whole orchard, but it is wise to cover at least one surrounding row of apparently clean trees. Before spraying badly infected trees, pick and destroy or bury all infected fruit.

Thorough spray coverage of the trees is essential for good control. Do not miss high top branches, or the tips of extra long side growths. Bordeaux mixture at 3-4-50 strength is fully effective if carefully applied. Extra strength is of no avail when application is careless, nor will it give better protection than carefully applied standard strength. If using last season's lime, test the mixture before applying it to the trees. Rather more lime may be necessary if it is not quite fresh. Particular care should be taken with Meyer lemons as they are much more susceptible than other varieties to verrucosis infection.

During pruning operations it is well worth while to have materials handy to treat such diseases and pests as bark-blotch, collar rot, borer, and dicky rice weevil. If treatments are delayed, the affected areas increase in size until final treatment may involve serious injury to the trees.

Cultivation

Cultivation will require attention from now on through the summer months. But it should be remembered that excessive, or too deep, cultivation can do almost as much harm as none at all. The soil should be loosened, but over-frequent deep cultivation is not good.

Permanent pasture has proved successful in some orchards, but much depends on management. Growth must be mown often enough to prevent seeding of the grass, or other crop grown, or the trees will suffer. All clippings should be used for mulching round the trees, to provide humus and assist in conserving moisture. Do not take the clippings away for other purposes.

Spring planting of trees should have been completed and application of fertilisers should not be delayed.

Budding of citrus trees may be done when the sap is flowing well in the trees and the bark will slip readily. For this purpose select buds from rounded wood of the previous two growth periods, using only buds from the middles of these growths. Budwood, cut before the trees start growth, should be kept fresh by storing in boxes of sand or sawdust, buried a few inches deep in the soil, in a shady but not too wet place. Budwood may also be cut when required for use, but frequently it is not so easy to get then because a proportion of the suitable buds may have started into growth.

The following points should be observed when budding:—

(1) Use a very sharp knife for budding.

(2) Tie firmly, but the ties need not be strained round the stocks.

(3) Work quickly and neatly to get best results.

(4) Loosen the ties three weeks after budding and cut the stocks back to about six inches above the buds if the latter have "taken" and are living.

It is difficult to obtain 100 per cent. "take" with citrus buds, and it is better to put in extra buds when working on citrus as they rarely succeed as well as buds on other fruit trees.

—I. L. NOTTAGE, Orchard Instructor, Tauranga.

Cool Storage Notes

Maintenance of Orchard Plant

NATURE has provided fruits for every climate, and man's ingenuity has invented and established refrigerated storage to extend their marketing season, so that everyone may have as an article of diet that which is necessary to good health.

Sturmers held for storage should be carefully examined at regular intervals to detect early signs of the development of flesh collapse. This precaution will prevent losses by eliminating the faulty lines from cool storage stocks immediately the first signs of deterioration are detected.

Granny Smith: Lines of this variety which are not oil wrapped require to be examined if undue losses from superficial scald are to be avoided, as the development of the typical discoloration associated with this condition is subject to increase progressively on this fruit as the season advances.

All stocks of fruit in storage should continue to be kept under observation and sorted in storage to individual growers' marks now that more space in the chambers is available. This procedure will greatly assist in minimising losses during the remainder of the season.

Maintenance of Orchard Plant: Orchardists should give careful attention to their spray outfits during the present emergency, as skilful attention and spare parts may become more difficult to obtain. This also applies to internal combustion engines and other orchard equipment.

During the winter months engines and pumps should have been thoroughly overhauled and cleaned of dust or dirt accumulation, and attention given to repairs. If spare parts are necessary, the requirements should be made known to your agent without delay. This precaution may save worry and loss of time during the busy season. Supplies of gland packing and jointing should be kept on hand in case they are required for replacement purposes.

When spray pumps are not in use they should be kept under cover, care being taken to flush them out with clean water, and to keep the vat full all the time.

Sizing Machines: The rollers and bins with which the fruit comes in contact should be scrubbed to clean away dirt and dust, as this accumulation is not only detrimental by damaging the fruit and reducing its market value, but may also affect the fruits with mould and fungus spores, and can cause heavy losses. During the harvesting season when the sizing machine is in constant use, these parts should be regularly inspected and cleaned. Grader markings on the fruit are frequently the cause of complaints when the fruit is exposed for sale later in the season.

Lubrication: The proper lubrication of bearings, rollers, and moving parts is necessary to economise in power costs, prevent unnecessary wear, and maintain the machines at their full capacity. It is essential to use the right grade of oil for engine cylinders and grease for bearings, and to keep supplies in sealed containers to prevent the entrance of grit and dirt.

All implements used on the orchard will benefit by a little attention occasionally, particularly in the prevention of rust.

—A. A. POWELL, Cool Storage Officer, Wellington.

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Guide for the Home Garden

Work in the Home Garden for October

IN vegetable production, as well as general agriculture, there are certain basic principles concerning the soil, which at all times should be observed.

As healthy, nutritious crops cannot be grown upon impoverished soil, it is necessary for those engaged in vegetable production to take every precaution to ensure that the best possible environment is provided for the crops which may be grown. This has been recognised by agricultural authorities in Great Britain, who have this season decided to return to pasture considerable areas of the farming land previously broken up and used for the production of vegetables.

Increase Production

More and still more vegetables are considered necessary to enable the Government to meet the probable immediate and future requirements. This means—in the home garden—that production must be substantially increased so that consumer demand shall be lessened upon whatever supplies of vegetables may be available. Towards achieving this, additional efforts to increase vegetable production must be made, and, if practicable, more land brought under cultivation As previously stated, lawns may be temporarily utilised, and there is no doubt that many of these would show subsequent improvement by a change, for a short period, to cultivated crops.

In the September, 1942, issue of the Journal of Agriculture a special appeal was made to the home gardener to maintain and, if possible, increase his tomato production of the previous season. This appeal is now renewed, and with considerably more justification than existed last year. As dependence to any appreciable extent on surplus market supplies may result in disappointment, every effort should be made to produce sufficient tomatoes for family requirements, and, perhaps, some to spare.

October, generally, is the month when planting for outside production begins. Many gardeners consistently meet disaster by taking the risks which are always associated with early planting. If plants have not been grown at home, those which it is intended to buy, and which may be exposed for sale, should be closely observed for the following points:—

1. They should be standing erect in the boxes, in dark coloured soil, which should be absolutely free from weeds—inquire whether the soil has been sterilised; if it has, so much the better.

2. The plants should not be less than 6½ to 8 inches tall.

3. The foliage must be a healthy green colour, free from disease, particularly small yellow, rusty spots, and moist dark patches; nor must the leaf edges be dark coloured and shrunken.

4. The plants should be closely examined from the base to a height of at least 3 inches. At soil level the stems should be a dark purple colour which, as it extends upwards, should gradually become paler, until ultimately it merges with the natural green colour of the plant. This particular characteristic will determine the degree of "hardening off" to which the plants have been subjected. The absence of purple

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colouring on the stems will indicate that the plants have not been properly "hardened off," and consequently may not be vigorous enough to withstand the changed conditions which will obtain after they have been transplanted. This condition is likely to exist if the plants are overcrowded in the seedling box in which they have been grown.

Vegetable Marrows

Preparation for sowing seeds of this early gourd may now be made. A hole 12 inches deep and 8 inches wide may be dug and half filled with some well-rotted stable or farmyard manure. After treading this down to a firm condition the hole should be filled with some good friable loam and levelled off. Into the soil and around the edge of where the hole was dug 8 seeds should be pressed 2 inches deep and covered with some properly made compost—if available. A mixture of soil and moist sand will also be suitable. When the seeds have germinated, only four plants—the strongest—should be permitted to grow. "Long White Bush" or "Long Green Bush" are the varieties recommended for growing in the home garden. These do not produce trailing vines, but grow like a bush under which the fruits develop, and, properly cared for, will prove excellent croppers.

The remarks relating to vegetable marrows are appropriate for all gourds—pumpkin and squash—except that for these a larger hole in the soil should be dug. No seed of these varieties should be sown until danger of frost is past. Varieties recommended are: Pumpkins, "Triumble" and "Queensland Blue"; squash, "Warren" (early), "Golden Hubbard" (main crop).

Potatoes

During the prevalence of humid weather conditions a sharp lookout should be kept for the appearance of late blight on the foliage. The disease is easily distinguished by the appearance on the leaves and stems of the plants of dark, water-soaked spots that soon develop into a condition which will threaten the whole crop with destruction. If preventive measures have not been taken, the plants should be well sprayed with Bordeaux mixture as soon as the disease is observed. Provided immediate action is taken, the spread of the disease to unaffected plants may be prevented. If, however, the disease appears to be spread over the whole crop, the foliage should be cut off at surface level and destroyed by burning. The tubers, if not dug immediately, are best kept well covered with soil. This will prevent greening which would render them unfit to eat, and will protect them from the depredations of the potato tuber-moth.

Rhubarb

During the present month (September), supplies from the summer varieties should be available. As harvesting proceeds, it is advisable to remove only mature stalks. The removal of short, undeveloped growth is unprofitable, neither is the full value of the product being obtained. At all times it should be remembered that this plant is a gross feeder, and one which it is hardly possible to over-supply with fertilising agents. Applications of organic manures are specially recommended, and, in addition, rich humus-forming material. During active growth liquid manure, applied after copious watering, is recommended.

Spring Cabbage

Harvesting of the autumn-planted bed of spring cabbages should be nearly completed by the end of October, and the area of the garden which it occupied would probably be suitable for a bed of leeks. If this is contemplated, and well-rotted stable or farmyard manure is available, a heavy application should be made and dug in as soon as it is convenient to do so. When digging is completed the soil may be allowed to remain fallow until

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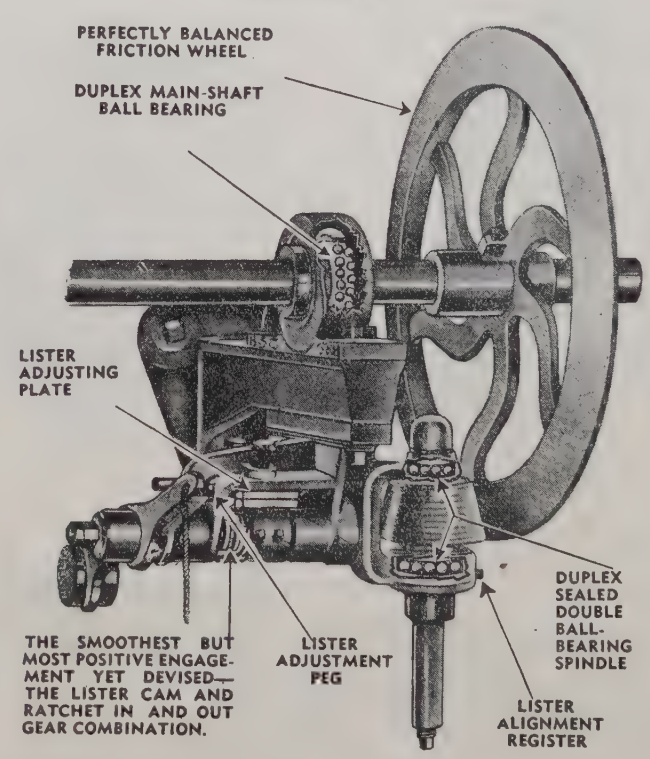
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required for setting out the young leek plants.

Peas

To assist in the prevention of the development of mildew and slug damage through periods of wet conditions, it is desirable to have the early sown dwarf varieties banked as high as practicable. The pods should be picked just as soon as they fill out. Neglect of this will result in the development of the remainder of the crop being restricted through the vines becoming stunted in growth.

Beans

Preparations may be made for an early sowing of a dwarf variety. The best of these that can be recommended is "The Prince." Danger of frost, however, should be considered past before the seed is actually put into the ground. Action otherwise may lead to disappointment, as this crop is particularly sensitive to extremely cold conditions, and frost will destroy young or matured vines.

Onions

During the recent periods of wet weather onion seedlings will have been difficult to keep entirely free from weed growth, and few plants will suffer more from weed competition for plant food. The early development of the bulbs may have been prevented by the undesirable weather conditions experienced, and should this have occurred liquid manure will assist to bring the growth back to normal. This, however, may easily be overdone, as excessive nitrogenous stimulation of bulb growth will destroy their keeping qualities when maturity has been reached. Weeds should be consistently destroyed, and this may be effectively done by shallow hoeing between the rows.

Cape Gooseberry

In the July issue of the Journal, a suggestion was made for sowing seeds of the Cape gooseberry. Provided this was carried out, plants will be well on towards setting-out size. However, if not home grown, these may be purchased from local seedsmen, and planted as soon as frost-free conditions will permit.

Of recent years raspberries and strawberries have shown a distinctly upward tendency in price, and Cape gooseberries are reputed to be excellent for jam-making purposes. Under conditions obtaining in the Dominion at present, and the fact that the plant is generally grown as an annual, the Cape gooseberry is worthy of a trial in gardens where there may be space available for its production. A rich friable loam is desirable; but it will grow well on most types of good soil. Heavy manuring is not necessary; but blood and bone applied at the rate of 3 or 4 oz. per square yard and worked into the soil before planting, along with a good dressing of wood ashes in order to supply potash, which is very desirable for this plant, will suffice. The plants should be set out in rows not less than 3 ft. apart, with 24-inch spacings in the rows. Shelter from cold southerly winds is desirable, but shade should be avoided.

General Work

September and October will be very busy months for those gardeners who are desirous of ensuring adequate supplies of green vegetables for autumn and winter. Seeds of most late-maturing varieties will require to be sown and preparations made to follow on with root crop seeding. For several months following September seeds of peas and beans, with succession of silver beet, lettuce, turnips, radish, and spring onions may still be sown. A second and a third setting of tomato plants must not be overlooked. If the vacant spring cabbage area is being used for leeks, the space occupied by the early spinach bed, may be utilised for the main crop of tomatoes. Likewise, when harvesting of summer cabbage is completed the space can be utilised for a late setting of tomato plants.

By this succession of planting the areas previously occupied by spring and summer cabbage will be cropped, leaving other available parts of the garden free for the autumn and winter brassicas, which will be so necessary for family use.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

Seasonal Work for Beekeepers

Examination of Colonies

SEPTEMBER is generally regarded by beekeepers as the first month of spring and a number of suitable days for the examination of colonies can usually be relied upon during this period. It will be possible to give hives a thorough inspection, but unless this is deemed essential it is better to leave the bees alone until the following month.

Where beekeepers are sufficiently observant indications of prosperity or otherwise within the hive can usually be detected by outward signs. When plenty of bees are flying and ample supplies of pollen are being brought in nothing will be gained by opening the hives providing the beekeeper is satisfied that the bees have ample stores. On the other hand, should it be noticed that few bees are leaving some hives when others are active and that little pollen is being brought in it is an indication that something is amiss. Such colonies may be queenless, possess failing queens, or perhaps be weak in bees through disease.

If on examination disease is found to be the cause of the trouble the infected hives should be immediately closed down, entrances contracted, and the bees and combs burnt the same evening, while the remaining hive parts should be removed and thoroughly sterilised. Queenless colonies and those with failing queens, if considered worth saving, should be united with medium-strength hives, or new queens, if procurable, introduced.

Weak Colonies

In general, weak colonies are of little use. Normal colonies open up in the spring with an average of three pounds of bees, so that hives with only a handful of bees covering a single patch of brood are of little value,. and are better destroyed and the combs used elsewhere. There are times, however, when weak colonies have good queens and are considered worth saving either by strengthening or uniting.

Strengthening is carried out by the addition of one or two frames of sealed brood with adhering worker bees obtained from the strongest hives. Brood and bees should be placed in the centre of the brood nest next to the colony's own brood. The addition of a frame of honey or a feed of sugar syrup is of further assistance and is usually necessary. When colonies are too poor in bees to justify strengthening, uniting to medium-strength hives by Dr. Miller's newspaper method is the most satisfactory. The poorer of the two queens should be found and killed immediately prior to the uniting of two colonies. The weaker hive should always be placed on top of the stronger. A single sheet of newspaper in which a number of small nail holes have been made, or two sheets the centre of which have been slightly dampened with honey or sugar syrup is placed over the stronger colony and the weaker hive set on top. The use of two sheets of paper helps to prevent the field bees returning to their former stand.

Drone Laying Queens

It is not unusual to find young queens which were apparently in good order in the autumn showing up as drone layers in the spring, although it is usually over-wintered old queens that fail in this manner. This condition can be brought about in several ways, perhaps as the result of unsuccessful mating, unfavourable weather conditions during the mating period, or some inherited abnormality.

Eggs laid by a drone layer are usually irregular, the resulting brood bulging unnaturally above the cells. To remedy these conditions the queen should be killed and the drone brood removed and replaced by two or three frames of normal brood, the bulk of which should be hatching, but a little unsealed brood and eggs is beneficial. The following day a cell can be given or a laying queen introduced, but uniting with a queen right nucleus or medium-strength colony is much better.

Laying Workers

Laying workers are usually found in a colony that has been queenless for a considerable time. It is this knowledge that should assist the beekeeper to decide whether a drone layer or laying workers are present. The brood when capped is not unlike that of a drone layer but a difference is noticeable in the manner the eggs are deposited in the cells, up to ten or more eggs being laid in some cells.

Beginners are occasionally misled by the large queen cells at times found in these colonies. They are useless, resulting as they do from endeavours on the part of the bees to supersede because of the abnormal conditions existing in the hive. These colonies are usually very weak in bees and are unlikely to prove profitable during the season, consequently it is better to destroy them. Attempts to requeen such colonies by orthodox methods have resulted in the loss of many good queens, but it is possible by attention to certain details to requeen them.

The whole of the drone layer's brood must be removed as their presence is responsible for the frequence of supercedure of newly-introduced queen. The method of introduction is also important and what is known as the honey method is usually successful with drone layer colonies. The drone layer

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brood should be replaced with a frame or two of normal hatching brood and the following day the new queen introduced.

The centre frame of brood is gently lifted from the hive and the honey under the top bar pressed with the thumb, making a depression in the comb. The queen is then dipped in the honey until well covered. She is then allowed to crawl slowly over the frame which is cautiously replaced in the hive. The whole undertaking should be carried out with as little disturbance as possible and with the minimum use of smoke.

—R. S. WALSH, Apiary Instructor, Auckland.

Beeswax Control Notice

"IT MAY not be generally known that beeswax plays a very important part in the prosecution of the war," said the Hon. D. G. Sullivan, Minister of Supply, when referring to the Beeswax Control Notice. 1943, which was recently gazetted.

"The importance of beeswax may be gauged when I tell you that the United Kingdom Government has purchased the entire output of Tanganyika. Last year, to meet the essential demands for beeswax New Zealand had recourse to importations from Tanganyika but that avenue is now closed, and there are insuperable difficulties associated with any other potential sources of supply. To meet the position we have introduced the Beeswax Control Notice under which a return of stocks is called for from all persons who have in their possession or at their disposal 10 lb. or more of beeswax. This return must be made within fourteen days, and must show the total quantity held, where stored, and whether the beeswax is crude, clear, or refined."

"It is known that there have been purchases of beeswax by commercial users and this notice specifically prohibits the disposal, sale, or transfer of any beeswax held, unless prior consent, in writing, has been procured from the Factory Controller," stated the Minister. "The use of beeswax, except for the use of a manufacturer of beecomb foundations or for the normal use of a beekeeper is also forbidden unless the consent of the Factory Controller is obtained. Beeswax is an essential strategic material for war purposes and the Factory Controller will allocate the available supplies for the essential needs of war."

"In normal times," said Mr. Sullivan, "beeswax in New Zealand is primarily used for the manufacture of floor polishes and cosmetics, according to the degree of refinement. It is also used for the manufacture of religious candles. Today there can be no question of normal use because, as I have stressed, it is a strategic material of vital importance essential in the manufacture of certain munitions we have contracted to make. The Air Force also uses beeswax to seal components and no other wax adequately serves the purpose."

"A still more cogent application of the use of beeswax," Mr. Sullivan continued, "is found in a recent important discovery on the part of our New Zealand scientists. When tinned butter was sent to our Armed Services in the tropics it was found that, due to the low degree melting point of butter it was liquefacious and unpalatable. When mixed with highly refined beeswax the butter retains consistency and is much more palatable and tasty to the men who are stationed on Pacific Islands and in other tropical areas. The beeswax in no way harms the butter and it certainly makes for better keeping qualities and increased palatability."

"In view of these facts," added the Minister, "it becomes obvious that we must have control of all available supplies of beeswax if we are to ensure the most essential use of our resources. In brief, then, the essential uses are the manufacture of munitions, the sealing of components for aircraft, increasing the palatability of butter for the Armed Services in the tropics, and the manufacture of candles for religious purposes."

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Notes for the Poultry Farmer

The Principles and Practice of Chicken-Rearing

By F. C. BOBBY,
Superintendent of Poultry Husbandry, Wellington.

HOWEVER good breeding stock may be, the ultimate value of the progeny must depend to a marked degree on the care and efficiency with which the birds are reared. Any check due to inefficient management that chicks may receive during the rearing period is often reflected in the constitution and production of the subsequent adult bird. Satisfactory pullets or cockerels cannot be reared from chicks of poor breeding stock, but undoubtedly many good chicks from sound breeding stock are spoilt by lack of knowledge on the part of the rearer. Thus, it becomes obvious that the whole success of a poultry-farm rests to a large extent upon a satisfactory rearing season. The season is a limited one, and accordingly it is not possible to make up for mistakes and subsequent losses by extending the season. Put briefly, time lost can never be made up entirely satisfactorily; hence the necessity for acquiring a full knowledge of this operation in poultry-keeping.

There are two main methods of rearing chicks:—

(a) Natural rearing with hens.
(b) Artificial rearing with brooding equipment.

Obviously, it is not possible to improve on the natural method if the hen is properly handled, but artificial rearing has been brought to a high standard of efficiency with the introduction of modern brooding equipment. No useful purpose is served by a comparison of the two methods. Under present-day commercial conditions, when large numbers of chicks have to be reared early in the spring, the labour involved in handling big numbers of hens would be prohibitive, while the impossibility of obtaining sufficient broody hens at the right time rules out any plan of natural rearing on an extensive scale. However, for the small poultry-keeper, or where particularly valuable stock is involved, there is much to be said for natural rearing.

Since artificial methods are more commonly in use today, these will be described first.

Artificial Rearing

Success in rearing depends primarily upon two basic principles, and these cannot be over-emphasised.

1. The necessity for constant attention to detail.

2. The maintenance of a high degree of cleanliness in everything with which the chicks come into contact, i.e., house, feeding utensils, etc.

Coupled with these two fundamental principles is the necessity for a chicken-rearer to develop a keen sense of observation. Many rearing troubles, including disease, may be brought under control quickly if observed in their early stages, and to effect this the chicks must be kept under constant and careful observation. There is nothing mechanical about sound rearing management. Success is nearly always the result of individual effort and initiative.

It is not within the scope of this article to give details of a house suitable for brooding chickens, but any such house should provide the following conditions:—

1. An ample and constant supply of fresh air.

2. Complete freedom from draughts.

3. The admission of direct sunlight.

4. Possess a dry floor.

5. Adequate floor space for the chicks at all ages during brooding.

6. Protection from wild birds and vermin.

It must be emphasised that draughts and dampness are two most undesirable conditions and lead to most of the major rearing troubles, such as chills and disease.

Floor Space

It has been assessed that a minimum of half a square foot of floor-space per chicken should be allowed during a brooding period of 6 weeks. It is, however, wise to be generous in the matter of floor-space, since overcrowding is a fatal error at all stages in chicken rearing. Many poultry-keepers find that a brooder-pen of approximately 12 ft. x 16 ft. provides satisfactory accommodation for 200-250 chickens up to 6 weeks of age.

Size of Unit

In general, small to moderately-sized units of chicks give better results than large units of, say, 500 chicks, other factors being satisfactory. While units of 120 chicks are eminently satisfactory, having regard to the cost of housing and equipment, and also to the labour involved, it is a common practice to brood units of between 200 and 300 chicks. Such numbers may be said to be satisfactory, but it cannot be recommended that bigger units be used.

In this connection novices should bear in mind when purchasing brooding equipment, that hovers are usually rated high for chick-capacity by manufacturers, and allowances made accordingly. The real chick-capacity of any brooder is the number of birds it will brood at the maximum age while heat is still required, and not the maximum number of chicks it will contain at a day old; hence, a brooder rated as 500-chick-capacity may only have a satisfactory working capacity of from 250-300 chicks.

Source of Heat

There is a number of methods of supplying heat for the first weeks of chick-rearing, forming the basis for the following types of brooders:—

1. Kerosene brooders.
2. Coal-burning brooders.
3. Hot-water brooders.
4. Electric brooders.
5. Battery brooders.

To these must be added the "cold" brooder, which is constructed to conserve the animal heat given off by the chicks, and is not in consequence supplied with a special source of artificial heat. This latter type will be described later, together with natural brooding.

Space will not allow of a detailed description of all the various types of brooders, but the notes which follow will serve as a guide for those who are not acquainted with any or all of them.

1. Kerosene brooders: Heat is supplied by a kerosene-burning lamp, and conserved by a metal or wooden canopy or hover. This is one of the oldest systems of brooding, and is satisfactory for small or moderately-sized units of chicks. These brooders have the advantage of being useful for any type of house, both fixed and movable, and are independent of any source of power. Against this, however, they require very close attention,

thereby involving more labour than the modern types of equipment. Unless given close attention there is always a risk of fire and marked fluctuations in temperature in the brooder. It should be remembered that fire is usually caused by over-filling the lamp containers with oil. These containers should never be completely filled, since the heat from the lamp causes the oil to expand and overflow, when fire may easily ensue.

2. Coal- or coke-burning brooders: These consist of a metal hover set over a coal- or coke-burning stove. By means of a wafer thermostat, draught dampers on the stove are regulated, thereby controlling, within certain limits, the rate of combustion of the fuel and the heat generated. Since a big volume of heat can be generated by these stoves, they are particularly satisfactory in cold climates and for brooding large units (500 chicks). Although not common in New Zealand, they have gained considerable popularity in the United States of America and England. These stoves are most reliable when supplies of hard coal are available. More care must be exercised when soft coal and coke are used, if even running is to be obtained.

3. Hot-water brooders: Heat in this instance is supplied by hot-water radiators or pipes under a suitably-shaped metal or wooden hover. These can only be used in a fixed brooder-house, fitted out with a hot-water boiler and pipe system. This entails fixtures which cannot be removed when the chicks no longer require heat —a disadvantage compared with kerosene or electric brooders. Since a number of heaters are usually driven off one boiler, and the chicks under these several heaters vary in age, it is not possible to reduce the heat in any given pen to meet the increasing age of any batch of chicks. Apart from the above-mentioned disadvantages the system will give satisfactory brooding, but has never won the popularity accorded to some of the other modern systems.

4. Electric brooders: This system of brooding has become most popular in recent years, and can be recommended wherever supplies of electric power are available. It has, however, one definite disadvantage—the complete loss of heat during a breakdown of the power. Such breakdowns are infrequent, or of short duration under normal circumstances, and precautions can be taken to meet such emergencies. It is sufficient to say that this particular disadvantage has not influenced a large number of poultry-keepers who are today operating electric hovers most successfully. Since this system of brooding is so popular, it will be described in greater detail.

The most important advantages associated with this type of brooding are:—

(a) A minimum of attention is required to be given to the source of heat itself;

(b) Cleanliness;

(c) The greater possibility of controlling heat at varying levels, as compared with other systems of heating; and

(d) The brooders may be moved easily to any position in the pen.

There are many methods of supplying heat under a hover of either metal or wood by electricity. Earlier electric brooders depended upon heat from one or more carbon filament lamps, which were usually covered with a special heat-resisting paint to reduce the light under the hover. This method of heating has now largely been superseded by the use of resistance wire units of varying wattage, although the long tubular lamp types are still popular with some poultry-keepers. There is further subdivision of the wire unit or heater types in use, namely:—

(a) Top heat supplied by a heater fixed towards the apex of a conical metal hover or in the top of a flat, wooden hover.

(b) Conical heaters set on the ground under a metal hover. It is a matter of opinion as to which is the more efficient of the two heating arrangements mentioned, but the writer definitely favours the top heat type, providing the heater is placed towards the centre of the hover and not towards the outside or perimeter.

The next point of importance is the amount and control of the heat thus supplied. For the average electric hover, a maximum available heat of 500 watts usually proves to be sufficient and satisfactory. Much advantage is obtained if two heating units are fitted—one of 350 watts and another of 150 watts, with appropriate switches to allow the use of both or one of these units. This method of wiring allows the use of 500, 350, or 150 watts, variations which permit adequate temperature control. Certain types of electric brooders are fitted with a thermostatic control, which can be adjusted to maintain any given required temperature. It will be obvious that where electric brooders are used a brooder-house is wired throughout, and the hovers may then be moved from compartment to compartment as required.

It may be stated without hesitation that there is a number of advantages attached to this system of brooding, where efficient equipment is used, that are not to be found with the other systems described.

5. Battery brooding: Battery brooders consist of wire cages with fine square mesh wire-floors. These cages may be divided into two compartments, one of which is heated, usually by electric heaters. Some have the entire cage heated. Of the two types, the former is undoubtedly the more desirable. Round the sides of the cage are placed water- and feeding-troughs, while under each wire-floor is a dropping tray. With a well-constructed brooder, this system offers a comparatively easy method of rearing for a strictly limited period. Some controversy exists as to the satisfactory nature of this method of rearing, and little can be said against the system if the chicks are only retained in the cages for **10 to 14 days.** Providing the operator has an adequate knowledge of the correct method of feeding under these extremely artificial conditions, apparently excellent chicks can be reared up to 4 weeks of age, but there is no denying the fact that such chicks are more difficult to handle successfully from that age onwards, when it is necessary to remove them to other quarters, i.e., carry-on cages or a brooder-house.

The Department does not recommend this system for rearing birds which are to be future breeding stock, unless the period of battery brooding is restricted to approximately 10 days. It has advantages over other systems, however, for rearing table birds, when any injurious effects of this particularly artificial method of rearing are of less importance.

(To be Continued).

Answer to Correspondent

Suitable Strain of Ducks.

"DIGGER" (GISBORNE):—

I have just read an article entitled "Selection of Ducks." I have about a dozen Indian Runner ducks and have had them for about three years. They are from an excellent laying strain, but have not proved as well as they ought to have. The climate is hot and muggy in the summer, with a wet cold winter, with ample running water available. The housing at night is warm and dry. Could you tell me if it would be advisable to change over to another good laying strain, such as the Khaki Campbell or not?

SUPERINTENDENT OF POULTRY HUSBANDRY:—

From the comments in your letter you would be well advised to purchase some young Khaki Campbells of a good laying strain. It should be mentioned, however, that it is not essential to allow laying ducks on to running water; in fact, in winter this may be a disadvantage from an egg production point of view. Ducks must, of course, have a plentiful supply of water in troughs which allow them to submerge their heads completely. Cold, running water tends to slow up production.

Federation of Young Farmers' Clubs

Report of Annual General Meeting

THE ninth annual general meeting of the N.Z. Federation of Young Farmers' Clubs (Inc.) was held this year at Palmerston North. There was a very representative gathering of fifty-six, delegates attending from all four councils. Mr. D. S. Ross (Dominion President), of Te Puke, Bay of Plenty, was in the chair, and the four Council chairmen were present—Messrs. A. S. Trotter (Otago-Southland), R. W. Wightman, Jun. (Canterbury), S. G. Avery (Wellington), and D. E. Waide (Auckland). It is interesting to note that these chairmen are all active club members.

Other delegates and members present were as follows:—Messrs. K. Hargest, E. Rabbidge, Jun., S. R. Whyte, and J. W. Wilson (Otago-Southland Council); J. Barclay, H. Bennett, R. S. France, S. A. La Roche, H. G. Stephens, J. W. Stewart, T. E. Streeter, and S. Watson (Canterbury Council); E. Beazer, W. H. Benson, N. Blatchford, W. D. Buick, A. C. Buist, Sgt. J. L. Carey, B. J. Collerton, C. J. Craig, M. Donald, H. B. Ellingham, H. McKenzie, W. F. McLaren, and J. L. Sunderland (Wellington Council); E. Melton, W. P. Nichol, G. Spratt, S. B. Vant, and A. F. Walter (Auckland Council); J. H. Bremner (New Zealand Farmers' Union); W. A. Jacques (Massey College); J. W. Woodcock (Department of Agriculture); A. E. Annett (Waikato); I. Algie, G. Bairstow, and B. Barker (Southern Hawke's Bay); W. R. Bremner, C. B. Cotterill, and G. P. Thurston (Taihape); A. D. Young (Bulls); C. S. Anderson, A. J. Galpin, and J. J. Wood (Bunnythorpe); P. G. Evans, H. A. James, B. A. McGregor, J. W. Morrison, R. L. Nicol, and M. A. Renall (Masterton); and S. Freeman (Dominion Organising Secretary).

Apologies were received from Messrs. L. J. Wild (Royal Agricultural Society), P. W. Smallfield (Director of the Fields Division), A. C. Cameron, and R. J. Reid (Otago-Southland Council), L. W. McCaskill (Canterbury Council), F. Atcheson, and K. I'Anson (Auckland Council), C. J. Hamblyn, and C. H. Schwass (Department of Agriculture), and A. P. O'Shea (N.Z. Farmers' Union). A letter was also received from the Minister of Agriculture (the Hon. J. G. Barclay) regretting his inability to attend.

At the chairman's request the meeting stood for a few moments in silence, to honour the memory of the late Sir Robert Anderson (a valued patron of the Y.F.C. movement), and of those members overseas who had given their lives in the cause of freedom.

The annual report and balance-sheet were submitted; these were published in this section of the August Journal; the balance-sheet showed a very satisfactory credit of £318 10s 2d, after sums of £100 each had been disbursed to the four Councils.

Election of Officers

Mr. T. E. Streeter (Motukarara, Christchurch) was elected as Dominion President, and Mr. S. G. Avery (Chairman, Wellington Council) was elected as Vice-President. Messrs. D. S. Ross and J. Barclay were re-appointed as Y.F.C. representatives on the National Council of Primary Production, and the Dominion Executive of the New Zealand Farmers' Union respectively. Mr. C. H. Schwass was re-elected hon. treasurer, and Mr. A. P. O'Shea as hon. auditor; both were thanked for their past services. Mr. L. J. Wild (President of the Royal Agricultural Society) was elected to the office of Grand Patron of the organisation, and the following as Patrons:—Sir Theodore Rigg, Sir Albert Ellis, Sir Wm. Perry, Sir Heaton Rhodes, the Minister of Agriculture, the Dominion President of the Farmers' Union, Mr. Wm. Goodfellow, Mr. A. C. Cameron, Mr. W. F. McLaren, Professor E. R. Hudson (Lincoln College), and Professor G. S. Peren (Massey College).

Y.F.C. Policy

This matter was again reviewed, and the policy determined at the last annual general meeting, and carried out during the year, was re-affirmed. The wording of the policy was as follows:—"That recognising the present difficulties and those that are likely to arise, this annual meeting is of the opinion that, although there must be a very definite curtailment of the activities of the movement, every effort should be made to continue the organisation. To that end it is suggested that (a) club activities should be carried on within the limits imposed by their relying on their own resources; and that wherever possible clubs should be encouraged to function; (b) Councils should continue in office, constituted as in their opinion is desirable; (c) the Dominion Executive Committee should still continue to function as constituted."

Remits

The following valuable remit was brought down by the Otago-Southland

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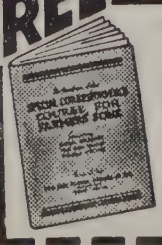

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Council, and occasioned some interesting discussion: "That a sub-committee be appointed to draw up a list of constructive suggestions showing how young farmers can develop their knowledge of moral, cultural, and aesthetic values. There is, in many country districts, a grave lack of facilities for the development of such values, and it is suggested that this committee take into consideration such things as (a) the possible development of cultural centres and a fuller utilisation of existing facilities to make country life more interesting and diversified; (b) the compilation of suitable literature for individual study, etc." The remit was sponsored by Messrs. Hargest and Trotter, and many interesting points were brought out by the various members who contributed to the discussion.

It was considered that too many farmers in New Zealand looked upon their farms mainly as a means of livelihood and were often intent on making as much money as quickly as possible in order to retire to the towns. Farmers should find more interest in their way of living than in mere physical labour; appreciation of the charms of country life could do much to soften the necessary drudgery, and give farmers greater comfort and satisfaction in their own calling. Even where facilities existed for social and cultural activities, the right spirit did not always prevail. One of the aims of the Y.F.C. movement should be to make country life more attractive. The country life of England was cited, where it was traditional for the land to provide both livelihood and recreation; the English farmer made the country his home, and paid more attention to the beauties of Nature. The New Zealand farmer was apt to make invidious comparisons between his own life and that of the town-dweller, because he made no real attempt to "get away" from his calling—this was apparent even in Y.F.C. lectures, where a diversity would be all to the good.

Reference was made to the manner in which freezing works and other places of industry had been beautified by gardens, etc.; this typified the spirit that should be inculcated into the life of the rural community. Country halls could be made beauty spots. One speaker considered that if the spirit of leadership could be promoted and developed, all this would follow. Another suggested that the economic aspect might perhaps loom larger in the North Island than in the South; he also appreciated the fact that long hours of work could render farmers not only physically tired, but mentally tired also. He, however, thanked the Otago-Southland members for their most valuable contribution, and considered it to be one of the ideals which the young farmers should keep uppermost in their minds. The remit was carried, and the Otago-Southland Council was requested to set up the necessary sub-committee, with the inclusion of Mr. La Roche (Canterbury Council).

Group of delegates attending the ninth annual general meeting of the Y.F.C. Federation, Palmerston North, July 1st, 1943. Second row (from left): Messrs. M. Donald and W. F. McLaren (Wellington Council); J. W. Woodcock (Department of Agriculture); R. W. Wightman, Jr. (Chairman, Canterbury Council); D. E. Waide (Chairman, Auckland Council); S. G. Avery (Chairman, Wellington Council and Dominion Vice-President); T. E. Streeter (Dominion President); S. Freeman (Dominion Organising Secretary); D. S. Ross (Immediate Past President); A. S. Trotter (Chairman, Otago-Southland Council); S. R. Whyte (Hon. Sec., Otago-Southland Council); S. A. La Roche (Canterbury Council).

A remit from the Auckland Council dealt with the Y.F.C. Memorial Scheme, and was brought down by Messrs. Spratt and Walter as follows: —"That emphasis be laid on the need to complete the organisation of the Y.F.C. Memorial Scheme, so that funds (already being collected in some districts) may be available to give the scheme a flying start to enable it to be put into operation as soon as the war is over." The sponsors made good their case in the face of opposition from those who felt it unwise to go ahead without definite knowledge of the form the memorial would take, and others who considered that the time was not opportune. Mr. Spratt strongly advocated the appointment of a sub-committee to act as trustees or advisors; he considered that if some such sub-committee or other similar organisation were not set up immediately, the scheme would never come to fruition, as it would be overshadowed by others of the same nature sponsored by other bodies. He further reminded members that the principle of the scheme had been approved at the previous annual general meeting. After much discussion the remit was carried, and the Auckland Council was requested to appoint the necessary sub-committee.

Further remits were carried, as follows:—

"That when valuable members of the District Committees and/or Councils are transferred to other areas, these bodies should notify District Committees and/or Councils in the areas in which these members are now resident, in order that their services may not be lost to the movement." (Wellington Council.)

"That as much as possible be done to encourage and foster Young Farmers' clubs in Army and Air Force camps on a Dominion-wide basis." (Wellington Council.)

"That in view of the possibility of the formation of Young Farmers' clubs in military camps, a ruling be given in regard to affiliation fees, subscriptions, etc. (Otago-Southland Council.) The ruling given was that, in such cases, the organising secretary have power to waive, if necessary, the affiliation fees, and that the matter of membership subscriptions and Journals be left to the discretion of such clubs themselves.

"That the utmost endeavour be made by the Federation to secure representation on the Rehabilitation Board and on every Rehabilitation Committee throughout New Zealand." This was an amendment to a remit from the Wellington Council urging that the interests of returned men be fostered.

"That as much material as possible be sent direct to clubs as well as to Council and district secretaries, and as well as published in the Journal of Agriculture." (Canterbury Council.)

"That the Dominion Executive examine the question of Y.F.C. scholarships from all angles, so that after the war the Federation can place some concrete scheme before the Government." This was an amendment to a remit from the Otago-Southland Council, recommending that a sub-

committee be set up for the same purpose.

"That a sub-committee be set up to explore the possibilities of producing a suitable propaganda film along the lines of the film 'Salt of the Earth,' now or at some future date." (Otago-Southland Council.)

General

Other resolutions carried included the following:—"That club secretaries be requested to take to their meetings copies of the latest issue of the Journal of Agriculture, and to bring up for discussion any matters therein of interest to club members"; and "That a letter be sent to the Dominion Executive of the New Zealand Farmers' Union thanking that body for its interest and courtesy in inviting Y.F.C. representation to its meetings, and giving assurance of the Federation's appreciation of the value of the reciprocal representation on the Y.F.C. Dominion Executive Committee."

Date and venue of next annual general meeting: As the meeting would be held in the Canterbury Council area, it was left for that body to decide the place of meeting; the actual date was left in the hands of the Dominion Executive Committee to arrange.

Votes of thanks were accorded to the retiring President, to the Department of Agriculture, and to the Organising Secretary. The meeting closed with a vote of thanks to the chair.

A feature of the meeting was a welcome to the delegates by Mr. A. E. Mansford, Mayor of Palmerston North; Mr. Mansford paid a tribute to the Y.F.C. movement, in which he had been deeply interested for some years. He was accompanied by Mr. Burland, Chief Cashier of the Reserve Bank, who, in making an appeal for the support of the War Loan, dealt logically with matters such as investment and saving as stabilisation measures against inflation.

Entertainment of visiting delegates: For the benefit of visiting members and delegates the Wellington Council arranged visits of inspection to the Plant Research Station, Massey Agricultural College, and the Government Seed Testing Station, besides an enjoyable evening at the pictures, and sundry morning and afternoon teas.

Obituary

THE sympathy of all associated with the Y.F.C. movement is extended to the relatives of the late Mr. W. G. Brownlie, of Frasertown, Wairoa, who died recently, at the age of 28 years.

"Bill" Brownlie, as he was familiarly known to everybody, was for a number of years an untiring worker for the Y.F.C. organisation—in fact, he had become a personality in the movement. As hon. secretary of the Wairoa club since its inception in November, 1936, his keenness and enthusiasm were responsible for the success of the club, which, with a membership of over 120, became the strongest club in the Dominion. He represented his club on the Northern Hawke's Bay District Committee, and was chairman of that body for some years; he was also vice-chairman, and later chairman of the Wellington Y.F.C. Council, and as a member of the Dominion Executive Committee, attended every annual general meeting of the Federation from 1936 up to the time of his demise. He was directly responsible for many of the major activities carried out by his club and District Committee, and his contributions to discussion and debate at Council and Federation meetings will be sadly missed.

Outside of Y.F.C. circles Mr. Brownlie was extremely public-spirited, and gave of his best in the assistance of patriotic and other endeavours in the Northern Hawke's Bay district. He held for some time the offices of secretary of the Wairoa Branch of the N.Z. Farmers' Union, and secretary to the Wairoa Primary Production Council. His passing leaves a gap in the ranks of the Y.F.C. organisation, and perhaps the greatest tribute that we can pay him is to echo the words of his fellow club members—we have lost a friend, and a "great chap" for the Y.F.C. movement.

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Dominion President

MR. T. E. STREETER, newly-elected Dominion President of the N.Z. Federation of Young Farmers' Clubs (Inc.) has been a keen and enthusiastic member since the inception of the movement. He was a foundation member of the Teddington Young Farmers' club, formed in July, 1934. Teddington was one of the first clubs in Canterbury, and with a membership of nearly 70, for a while held

MR. T. E. STREETER

pride of place as the strongest club in the Dominion; it also undertook and successfully carried out a greater diversity of activities than any other club in either Island.

Mr. Streeter has very capably held the following offices and positions in the organisation: Club secretary; club delegate to the Christchurch District Committee; vice-chairman and later chairman of the Canterbury Council. He has been a familiar figure at Dominion Executive and annual general meetings of the Federation for some years, having represented the Canterbury Council for a considerable period.

It is interesting to note that recently, in company with other members of the Canterbury Council, he assisted in the formation of a Young Farmers' club at St. Andrew's College, Christchurch, of which he himself is an old boy. Mr. Streeter is engaged in farming in the Motukarara District, Christchurch.

Reports on Club Activities

WESTERN SOUTHLAND.

Orepuki.—The Y.F.C. campaign in schools and the recommendations regarding "Leadership," to be fully discussed at the next meeting; prepared speeches by members also to be undertaken. Address by Mr. B. C. Horrell on "The Breeding of Farm Animals." Seventeen members present.

Wyndham.—Discussion re field day. Address by Mr. L. Harper on "Starting Out on a Farm." Ten members present out of a total of 14.

DUNEDIN.

Palmerston.—After having been in recess for over a year, an annual meeting was held, and it was decided to resume activities. Nine members were present, and the officers were elected.

West Taieri.—Arrangements for a club dance. Lecture at next meeting on "The Care of Ewes at Lambing Time." A short talk was given by S. Quennell, a club member, on "Flock House Training Farm"; the speaker, who had attended Flock House, gave a very interesting account of the work of the farm, etc.

SOUTH CANTERBURY.

Cannington-Cave.—Annual meeting. Officers elected: Chairman, D. Sewell; secretary and treasurer, R. S. Malthus. Two club members, J. Gillingham and I. McKerchan, were farewelled. Talks entitled "Impressions of Army Life" were given by A. McKenzie and G. K. Crawford. There were 10 members in attendance.

Fairlie.—Annual meeting. Officers elected: Advisory President, Mr. L. M. Harvey; chairman, W. Pringle; secretary, B. J. O'Neill; treasurer, A. P. Whatmen. Special mention was made of the death of Mr. Wm. Scott, late Advisory President to the club; it was considered that the club had suffered a great loss. A vote of sympathy to his relatives was carried. Despite difficulties, members were unanimous in their decision to keep the club active.

MID-CANTERBURY.

Methven.—The chairman, R. Wightman, gave a report on the annual general meeting of the Federation, which he had attended at Palmerston North. After general business had been disposed of a debate took place between the club's "A" debating team and a team from the Methven District High School on the subject, "That the Present-day Methods of Farming are Detrimental to the Land." A discussion also took place on the subject which the club's "B" team is to debate against the Ashburton High School in the near future, "That in the Face of Increasing Industrialisation the New Zealand Farmer will be Forced to Adopt the British System of Mixed Farming." The Rev. Mr. Keenan acted as judge in the debate. There was an attendance of 32 out of a total membership of 51.

CHRISTCHURCH.

Darfield.—Arranged date for annual ball; profits to go towards the Christmas Parcels Fund for members overseas. Several letters from club members serving overseas were read to the meeting. A team was selected to debate with a team from the local Farmers' Union. It was decided to initiate a drive for the enrolment of new members. Thirteen members were present.

St. Andrew's College.—A club was recently formed at St. Andrew's College, Christchurch; Messrs. T. E. Streeter (Y.F.C. Dominion President), S. A. La Roche, and R. G. Jolly (secretary, Canterbury Council) attended the initial meeting, at which 42 members were enrolled. Officers were elected as follows:—Advisory President, Mr. G. S. McKenzie; chairman, D. W. Mulholland; secretary, D. G. C. Campbell; treasurer, E. S. Stevenson; committee, the officers, with the addition of A. W. Johns and G. A. McLean. The club has already, among other activities, prepared an extensive and comprehensive estimate of the cost of wheat-growing, which has been published in the Christchurch "Press." Y.F.C. members throughout the Dominion will wish this young club the best of success.

NORTH CANTERBURY.

Scargill-Omihi.—Final arrangements for a dance to be held in conjunction with the Scargill-Motunau branch of the W.D.F.U. Preliminary arrangements for a field day to be held in October. Mr. E. P. Shier gave an interesting talk on "The Advantages of Lime," and also answered numerous questions pertaining to livestock.

NELSON.

Motueka D.H.S.—A club was recently formed at the Motueka D.H.S., with an initial membership of 16. The best wishes of all other clubs in the Dominion will be extended to this new club.

MANAWATU.

Feilding.—One new member elected. The chairman, E. Beazer, gave a report on the recent annual general meeting of the Federation. Members decided to accept an invitation to visit the Bunnythorpe Club in the near future. Mr. Somerset spoke on "What We Will Do With Germany After the War"; this was

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followed by a lively discussion. At the previous meeting Mr. Somerset spoke on "Russia." Both meetings were held at the community centre.

Taranaki Regiment Y.F.C.—Field day on Mr. H. J. Lancaster's property, Glen Oroua. Demonstrations were given by Mr. Lancaster, Sen., on Dairy Cattle, and by Mr. Lancaster, Jun., on Sheep. There were 18 members in attendance.

WAIRARAPA.

Carterton.—Debate and social. Four new members enrolled. The debate was between the W.D.F.U. and the Y.F.C., the subject being "Should Husbands Help With the Housework on Wet Days?" The W.D.F.U. took the affirmative and won by a narrow margin. The Rev. Mr. Couling acted as judge. Dancing brought a very enjoyable evening to a close. Fifteen club members were present at a short meeting, which took place before the social, and a large number of visitors attended the debate, etc.

Masterton.—Arrangements finalised for a club dance. Club to invest £10 in the Third Liberty Loan. Decided that at next meeting there should be an open discussion on the subject, "That Inspection of Rams at Ram Fairs is in the Interest of the Farmers." Mr. E. Wilson exhibited films as follows:—Rural England, Typical New Zealand Scenes, Earthquake Damage in Masterton, and the Centennial Exhibition.

TARANAKI.

Alton.—Appointment of D. Leigh as honorary secretary, in place of L. Garnett, resigned. Address by Mr. C. Palmer on "Palestine and Australia"; the address was illustrated with films.

WANGANUI.

Taihape D.H.S.—A club was formed recently in the Taihape D.H.S. with an initial membership of 13. This club was formed by members of the Taihape Club, as an alternative to taking the High School pupils into the senior club, and is considered an advantage, as the High School Club holds its own meetings, and has its own officers and representatives on the District Committee. Members from the senior club attend meetings and give every assistance possible, but the "junior" club is encouraged to run its own affairs. The chairman is a farmer's son and the secretary a member of the older club. The officers elected at the initial meeting were as follows:—Advisory President, the headmaster; chairman, C. Mortland; secretary, B. J. Collerton; committee, the above, with the addition of T. A. Lelievre, F. Ewart, E. Cunningham, L. Harfard, D. Martin, and C. Chestnutt.

SOUTHERN HAWKE'S BAY.

Dannevirke.—One new member elected. The chairman, Mr. Ellingham, gave a short report on the Federation annual general meeting. The secretary reported on correspondence and arrangements in connection with a meeting to be called in Woodville for the purpose of reviving the Southern Hawke's Bay District Committee. Delegates to District Committee elected as follows:—Messrs. B. Bary (advisory), E. Ellingham, and J. L. Sunderland (active members). Arrangements were made for a lecturer at the next meeting. Mr. D. T. Scott spoke on his trip to Russia in 1939, he gave a very interesting talk, presenting his subject in a most unbiased manner, and was accorded a vote of thanks. A field day was held at Mr. W. Edgecombe's "Mana Stud" Farm at Umutaoroa; it is hoped to publish an account of this at a later date.

NORTHERN HAWKE'S BAY.

Meeanee.—Business meeting. Club meetings adjourned for three months on account of depletion of membership. Ten members present.

TE KUITI.

Paewhenua.—Lecture by Mr. H. E. Walters on "Breaking In Virgin Land in the District." There was an attendance of 18. A field day was held in a paddock of Mr. C. Mexted's, and took the form of a dog trial. A demonstration of working a dog was given by Mr. R. W. Cowan; Mr. E. Grice acted as judge, and pointed out faults, etc. Members then worked their own dogs in a trial, Mr. Grice again acting as judge. The attendance was 42, including 28 visitors.

BAY OF PLENTY.

Paengaroa.—The chairman congratulated the members who took part in the Western Bay of Plenty district seven-a-side football tournament, the club team being D. Ross, L. Williams, M. Steel, S. Treloar, G. Borrie, B. Dodds, and B. Calder. Arrangements made for the birthday dance. It was decided that at the next meeting the club members who attended the annual general meeting of the Federation should report on the business transacted; also that several junior members should give short talks. Mr. A. E. Spratt gave a very interesting talk on "Sheep Farming As I Have Found it in the Bay of Plenty." The speaker took the various activities on a farm throughout the year in turn, and gave his ideas and experiences. There was an attendance of 19.

Tauranga.—Arrangements for forthcoming Y.F.C. ball. Decided to hold a social evening. A very interesting lecture was given by Mr. Frank Keam on "Livestock Troubles"; the speaker dealt mainly with mal-presentations of calves at birth, but covered other stock ailments also. The lecture had been advertised by the club, and, as a result, in addition to 16 club members, there was a large attendance of local farmers by whom the lecture was greatly appreciated.

Te Puna.—Visit to dairy factory arranged. Team selected for final debate in the district competition. Lecture by Mr. F. Keam on "Mal-presentation at Calving, and Common Stock Troubles." Nine members present.

Te Puke.—P. Nichol, club delegate to the A. and P. Association, gave a comprehensive report on the recent A. and P. meeting. Decided to hold a junior club debate; teams were selected as follows:—(a) W. Bayliss, G. Nicholls, P. Hunter; (b) E. Melton, J. Roderick, S. Caldwell. There was an attendance of 12 members.

Whakatane D.H.S.—Demonstration by Mr. McIndoe on the anatomy of a dairy cow; the parts of the cow were first pointed out on a living animal—a cow was then slaughtered and the various stomachs, etc., shown and their functions explained. There were 25 members present.

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Health Notes for the Farm

What's Wrong With Motherhood?

Contributed by the
DEPARTMENT OF HEALTH

IN RECENT discussions about post-war planning and reconstruction the importance of an immigration policy for this country has been emphasised. Advocates of a properly-organised and selective policy of immigration are anxious to see the country more fully populated and more developed, to see some of the open spaces all around us put to some useful purpose. Without a population it can't be done, and immigration is undoubtedly an excellent way of filling the need.

Best Citizens

The best citizens of a country are the native-born citizens, the people who spring from their own good earth and who have something a little deeper and more binding than a material interest in the place. In other words, the best citizens are our own babies.

In spite of the confidence that modern medical science inspires there still seems to be an unfortunate and widespread objection to having babies. This is treading on somewhat delicate ground, but it is done without any apology, because some people need to be told about it, particularly those people who deliberately remain childless from purely selfish motives. It's this selfish aspect that helps to put a lag in our birth statistics.

Then, of course, there is the section of prospective mothers who will not have children because they are frightened. Maybe they have been through the experience, and perhaps some have a very good reason for being frightened. They deserve our sympathy.

No Danger

On the other hand, there are a lot of healthy young women, excellent prospective mothers, who simply will not face up to the physical demands that child-bearing makes on them. But so long as they are healthy, and look after themselves properly, there's nothing to be scared about. These are the people who should be told about it, the people who are frightened about the outcome of child-bearing. The selfish-minded persons do not matter so much at the moment, because their attitude requires a rather different psychological approach.

In the old days—round about a hundred years ago and more—child-bearing was regarded by many as a mysterious accident or an act of providence; whereas it was, in reality, a surgical happening fraught with the gravest risk for the mother and the child in that pre-antiseptic age. Yet, in spite of it, our forbears continued to carry on the good old family name with a courage and consistency that were remarkable.

A recently published history of medicine contains some particularly graphic and decidedly stark descriptions of the ceremony of child-birth in the bad old days—the lying-in ceremony, as it was commonly known. A prospective mother in the 17th, 18th, and early 19th centuries often had to take her place with three or four other patients in an unclean bed five feet wide, and wait, if she survived the pestilence of the place and the butchery of the midwife, for the puerperal fever which killed as many as 20 per cent. of her sisters. Those, too, were the days of the terrible obstetrical stool. and other brutal aids to childbirth.

Motherhood Today

But with the advance of science and the development of the doctrine of preventible infection, all that sort of thing is just an ugly memory. Round the motherhood of today has been built up a powerful protecting wall of asepsis, anaesthesia, of obstetrical skill, and pre-natal care. No longer is this event darkened by the shadow of death; it is illuminated by the clear light of precise medical knowledge. The prospective mother is assured in advance of the safety of her condition, and is delivered of her babe with a minimum of suffering.

No other country in the world cares for its mothers more than New Zealand, and the war has not interfered with the ante-natal and maternity services. Occasional shortages may have occurred in the dietary, but these have been overcome by substitutes.

Some young women have asked when is the best time to have a family. Opinion seems to agree that it is better for a woman to have her first child between the ages of 21 and 25, and to bear children at three- to four-year intervals, until the family comprises three or four children.

Everywhere we hear the demand for more population and immigration. What finer immigrants are there than our own offspring, and what more splendid heritage is there than that of motherhood? On motherhood and family life is built the structure we know as society, and the strength and steadfastness of society are the strength and steadfastness of the nation.

Helpful Hannah Says . . .

If your woollen stockings are too old to wear, cut the feet off, draw one leg over the other, fold over, and tack down the sides to form a bag into which you can slip your hand. They make ideal polishers for stoves, floors, and even shoes, while keeping your hands clean.

* * *

Perspiration stains will rapidly disappear if you mix some baking soda to a thick paste with water and spread it on the marks. Leave for a few hours then wash in the usual way.

* * *

If using marking ink for putting your name on handkerchiefs etc., write the name on the article first with a sharp lead pencil, then go over it with the marking ink. The ink does not smudge or spread.

* * *

When you are ironing hankies or anything for that matter, iron them so that any tears are on the outside and will show. Nothing is more embarrassing than to take a fresh handkerchief, and find it is torn when opened.

* * *

Before removing rubber gloves, after washing clothes or washing up, hold your hands under cold water for a few moments; the gloves will slip off quite easily.

* * *

When buying kitchen utensils such as potato-peeler, bean-slicer, masher, etc., don't have all the same coloured handles to tone in with your kitchen colouring; they will be easier to find if they are coloured differently.

THE GOOD NEIGHBOUR.

Let's Greet Spring

LET'S greet spring this year with a smile on our lips and a song in our heart, and what matters even more, let's greet spring this year with a promise that we are going to be optimistic whatever happens. It may not sound a very hard promise to make, but I know there are many of you who will agree with me when I say that it is not always easy to be outwardly cheerful when inwardly the walls of your very existence seem to have crumbled in ruins about you. Yet I know these folk are the ones who are going to make the biggest effort to be optimistic in the future. And it is because of these brave folk that I want to share with you a piece from one of my letters for I know it will be a comfort to many of you who are making brave attempts to keep the banners of courage flying high.

My letter came from our old friend "Tiggetty Boo," who has sent us many inspiring thoughts before, and in this letter she wrote: "I would like to thank 'Hydro' for her letter which you printed in the July issue. I'd like to be able to tell her how far her courage will take her, and how much she is keeping in step with that beloved soldier who has gone on. Her words bring to my mind a verse I came across once, the concluding lines of which say:

'For my sake turn again to life and smile,
Nerving thy heart, and trembling hard to do
Something to comfort weaker hearts than thine.
Complete these dear unfinished tasks of mine,
And I perchance may therein comfort you'

"Others WILL derive comfort and regain tranquility of mind by the beauty she is creating in her garden. It is just what our boys will appreciate when they come back from overseas."

Others wrote, too, to tell how they agreed with "Hydro" in her views, and here is a piece from "Biddi-Jan" on the same subject: "My brother says he is going to have a holiday at Mt. Pleasant, and just lie in the grass and sniff the flowers, and I am sure most of the boys over there will be looking forward to flowers and green trees."

Now that the sunny days are coming again, let's all do our best to make the world a happier place for those about us—no easy task in the face of the destruction that is taking place in other countries, but for that very reason we must strive to make a greater effort than ever before to greet the spring with a promise to be optimistic. Plant gay flowers in your garden, wear bright, pretty frocks, polish up your smile if it has become at all dingy during the past months, and then go out and cheer someone up. You try it one day—it's fun!

And now just one more thing I want to say—one of my favourite quotations is "A gardener never grows old for she is always looking forward to next spring," and I would like to tell you that you will never grow old so long as you are looking forward to cheering someone who is not as happy as yourself. So greet Spring this year with a bigger smile than ever before, and pass the sunshine on to others.

Mary

A SPRING DAY

Good-bye to pain and care! I take
Mine ease today
Here, where the sunny waters wake
And ripples this keen breeze, I shake
All burdens from the heart,
All weary care away.

Stop and Think First

SOMETHING happened last week to make me literally stop and think. It was a Saturday morning, and Saturday morning always runs away from me. I just couldn't get ahead. The telephone rang consistently, and finally one of the children came in with a knee nearly chopped off, and there was blood everywhere. I thought I would never get the vegetables done, and baby should have been put down for his nap ages ago—you know the feeling, face getting redder and redder, temper getting frayed, snapping at the children, and forgetting that "tomorrow is another day."

Then the telephone rang again. I dropped the onion I was peeling, rubbed my hands on my apron (always a sign that I am rattled) and fairly sizzled across the living room to the telephone. Just as I jerked the receiver off in an angry mood, preparatory to snapping a curt greeting into the mouthpiece, there flashed through my mind "I think you've got one of the nicest telephone voices I've heard." Someone had told me this years ago, and the memory often flashes through my mind as I lift up the telephone. So in this split second I controlled my voice, smoothed out my face (you can't smooth out the one without the other), and answered in my usual voice. It was a very dear friend of mine, ringing to tell me that the brother who had been reported missing on air operations over Germany had now been officially reported killed.

I tried my poor best to comfort her, but my sympathy sounded a little hollow to my own ears for my conscience was so guilty. She had thought enough of me to ring me and tell me this, and I had very nearly bellowed and snapped into the telephone. Just imagine if I had done so on that one time of all times when my friend's ear would undoubtedly have been attuned to unhappiness or irritability. As I say, it made me stop and think, and helped me to get things into their true perspective once again.—**Rojini, Auckland.**

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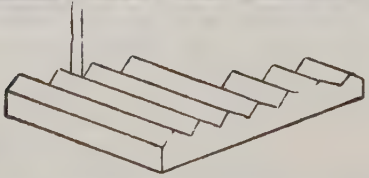

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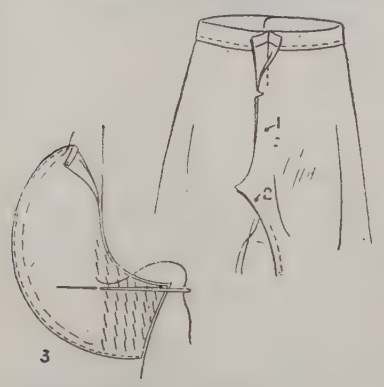
The articles are really worth while studying, because making men's suits last longer is a real economy and helps the war effort.

SEAT RETREADS.—Retread the seat to protect against wear, perspiration, and scratchy material—and to make it easier to keep a press in the suit.

1. Mark notches for matching, then rip the back rise of the trousers from about 6 inches below the top down through the crotch.

2. Rip the inseams down 3 or 4 inches

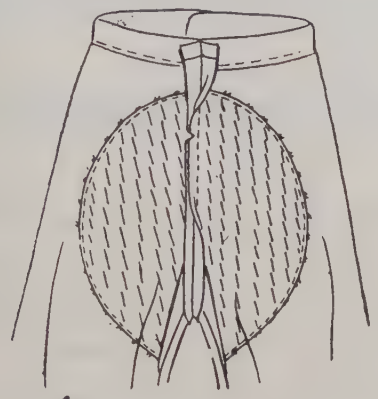


from the crotch. Press the seam creases out flat.

Cut a paper pattern for the retread. Fit and shape it carefully. From this pattern, cut two pieces from preshrunk rayon lining, one for each side of the seat. Turn under and baste the outside curved edges of these two pieces. Stitch by machine close to the edge and press. Pin each half retread in place with the seams carefully matched. Baste loosely.

3. Start at the crotch point and tack each retread smoothly in place with tailor's basting. Make the basting stitches about one-half inch apart and the rows of basting about one-half inch apart—a little closer where the cloth is thin. The basting should follow the lengthwise grain of the cloth so no stitches show on the right side.

4. Slip-stitch the outer edge of the



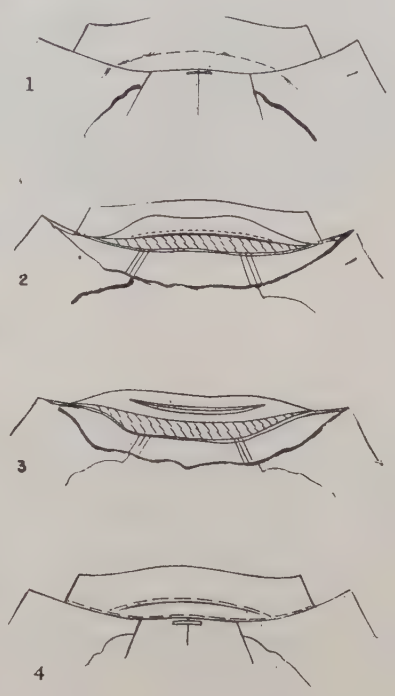
retreads to the seat of the trousers. Be sure no stitches show on the right side.

Restitch the inseams, then stitch the back rise twice for strength. Steam-press.

COAT REPAIRS.

Worn Collar Roll.—1. Run a white basting thread along the right side exactly on the line of wear. Rip collar and lining apart around the neck.

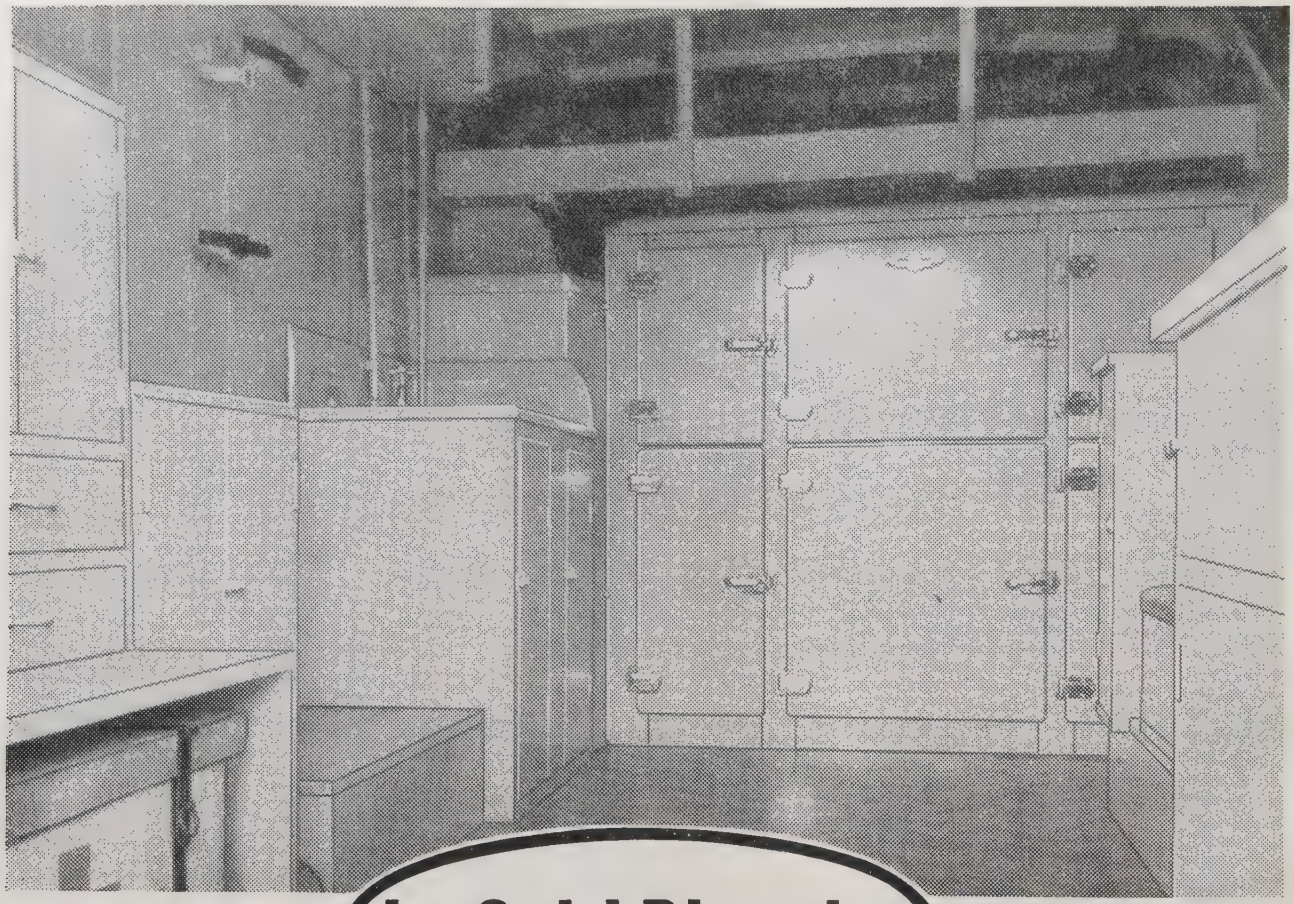
2. Inside the collar, pinch the line of wear up into a fold with the white basting line on the folded edge. Baste with small stitches. Machine-stitch no more than one-eighth inch from the folded edge. Clip through the fold with sharp, pointed scissors. The fold is cut after stitching, rather than before, to hold the shape of the collar. It also does away with the problem of matching the pattern of the cloth along the seam line.



3. Press the new seam open. Shape the top collar back in place over the under collar.

4. Hold loosely so the collar will not curl along the outer edge, and baste on the roll line to keep top collar in place. Smooth, pin, and stitch the lining back in place around the neck.

5. To make the seam line along the collar roll show less, pinch it between the thumb and forefinger, and stitch



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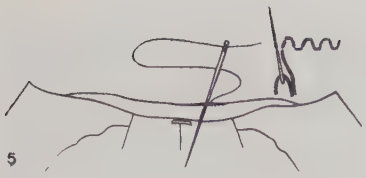
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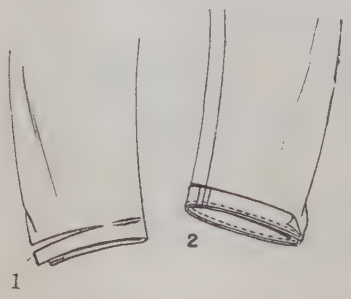
back and forth over it in a V direction. Be careful to pick up only one yarn on each side of the seam line. Pull the thread up close. This is known as the rantering stitch. Press, and the seam will hardly show.

Frayed Sleeve Edge.—Rip the sleeve lining from the coat at the cuff. Cut off sleeve buttons that are in the way. Take out the cotton fabric stay inside. Turn down the sleeve hem. Brush and scrape out all lint and soil.

1. Cut through the crease exactly on the line of wear. Trim off the worn parts of both the sleeve and the inside facing. Keep a straight even line as you cut.

2. Pin and baste the facing back to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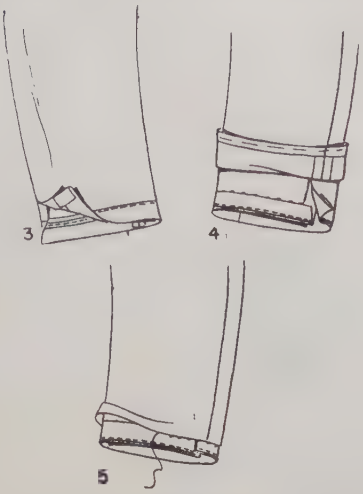
the sleeve, right sides together. Match seam and press lines. Take a very tiny seam, no more than one-eighth inch deep. Press this seam open.

3. With the facing turned down, stitch it by machine very close to the seam line. This line of stitching keeps the seam flat so that it won't roll to the outside.

4. Turn the facing up inside the sleeve and baste it so that the seam line and machine stitching are just inside the sleeve.

Fold and finish the vent corners as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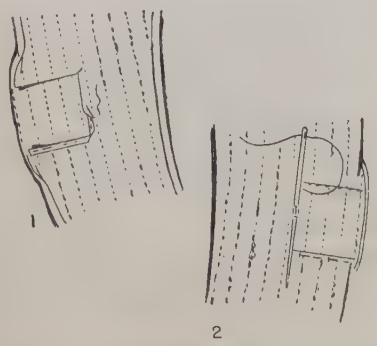
they were before the sleeve was ripped open. Be careful to turn in all raw edges so that none will show.

With a loose stitch, tack the facing to the sleeve.

5. Sew the lining back in place. Press, and sew the buttons back on.

Worn Elbows.—Rip the lining apart from the sleeve at the cuff and pull it up into the sleeve where it will be out of the way of your work.

To Repair a Hole.—Set in a block of matching material. If you have no extra matching material on hand, enough can be cut from the inside facing of a vest or coat. Replace that material with another of similar colour and weave.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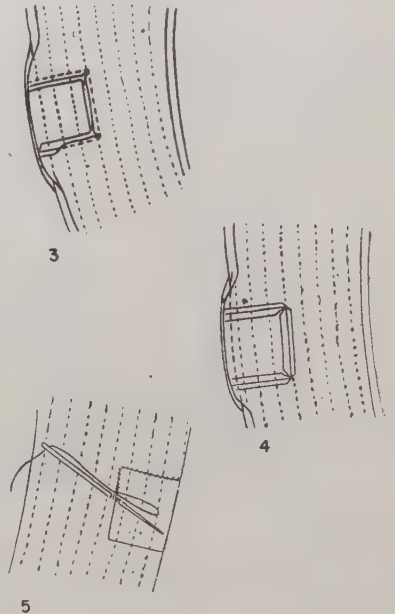
1. Cut with the grain of the goods around the hole. If it is next to a sleeve seam, rip the seam open and let one side of the finished block go into the seam. Press the piece you cut out and use it as a pattern for cutting and matching the new piece to be set in. Cut the patch piece about one-half inch larger all around than the pattern so as to have one-fourth inch for seams. Clip each corner of the hole diagonally. Turn the edges under one-fourth inch. Baste and press lightly.

2. Lay the patch on the inside of the sleeve under the hole with the pattern matched exactly. Pin in place. With contrasting thread hem the folded edge around the hole to the patch. Take stitches about three-eighths inch apart through the edge of the fold. These stitches are to serve as a guide line for seaming by machine from the wrong side.


3 4 5

3. Now turn to the inside of the sleeve and stitch the patch in by machine on the line of the contrasting thread. The seams on all sides of the patch have to be the exact width allowed, or the patch will not lie flat.

4. Steam-press the seams open and mitre or clip out the bulky corners.

5. On the right side hide the seam line with the rantering stitch used to finish the repaired collar roll. This strengthens and hides the seam line.

This article, "Mending Men's Suits," by C. L. Scott and A. F. Hagood, is reprinted from a bulletin issued by the United States Department of Agriculture.

(To be continued).

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When aluminium saucepans get very dirty scrape them well, and rub over with a kerosene rag before cleaning with steel wool. A kerosene rag will also remove grease-marks from an aluminium-painted stove.

When making jam, instead of using a wooden spoon, use a fish slice. When stirring the jam, the bottom edge of the slice scrapes any jam that is inclined to settle on the bottom of the pan, and prevents the jam from burning.

To keep a cut-glass vase free from the stains of flowers, place a piece of green paper in the bottom of the vase; then put in the flowers. If you do this, the paper will absorb all the sediment from the flowers, and so keep the vase clean.

The pain and discolouration of a bruise can be considerably lessened if a little dry powdered starch, just moistened with cold water, is applied at once. Butter or olive oil rubbed lightly over the place are two other excellent kitchen remedies for a bruise.

ON THE BLUE HORIZON...

Skies are grey now and dreary, but look ahead—the far horizon there is blue. That blue shall someday fill the midday heavens. Halcyon days will come again, bringing beauty back. Someday you will be out again under blue skies, your man at your side, feeling with a new intensity that life is warm and vibrant . . . with a new understanding for the beauty of simple, deep enduring things. Berlei beauty — under a war cloud now — will be back. Government standardization wisely conserves the precious fund of skill and material that Berlei beauty needs, for the war which must be won, and won the hard way. But someday there will be no restrictions on our making the foundations you love. There are halcyon days ahead when we shall again be able to create for you the beauty now denied in a Berlei.

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"Awkward Moments"

THESE entries should prove a tonic to tired spirits, for some of them are really amusing. I know it is all very well for us to sit back and laugh at the discomfiture of others, but we all agree that the moments must have been most awkward for those concerned at the time.

Here are the winners for you: first prize to "Bet" of Plimmerton, and second to "Gerrie Mac," of Dunedin. Two good entries, and here they are for you.

First Prize

WHILE my wife and I were visiting England just before the war we once had the honour of contacting a member of the upper class. It was necessary for me to interview a certain very wealthy gentleman who proved to have a most extraordinary bulbous nose. I have seen large noses before but, believe me, this one could have been entered for a world brandy-drinkers' competition. It was desirable that I should stand well with this gentleman and I decided to enlist my wife's charms by inviting him to tea. This was arranged with great difficulty as apparently he was very sensitive about his appearance and his secretary warned me that often he caught people off their guard staring with amazement at the monstrous organ which dominated his features. The slightest hint of surprise or interest in one's expression might be enough to send him rushing away in a tantrum.

My wife was duly warned of the importance of the occasion, and of the visitor's peculiarity. Anxious to do her best she was very nervous but quite charming, and I felt we were doing famously. About to pour the tea, my wife turned to our distinguished guest, saying brightly, "Excuse me, but do you take milk and sugar in your nose?"—**Bet, Plimmerton.**

Second Prize:

I HAD been called to town in a hurry, and my mother had come round to mind the children. I dashed away to the bathroom to tidy up. Our bathroom is at the end of the hall, and opposite the front door. The late afternoon sun comes through the glass in the front door, and shines into the children's room, so we have no curtain in the hall.

After a hurried scrub, and clad only in singlet and a pair of bright pink bloomers, I opened the bathroom door to proceed to the bedroom to don the rest of my clothes, when I was greeted with "Good morning, Madam." There stood the front door wide open, and a workman on the front door mat. No, the floor didn't open and let me slide in, to hide my embarrassment, but I hastily back-pedalled into the bathroom. I was sure I couldn't face that man again if I was clad in a coat of mail, but life's awkward moments aren't like that, I find. Troubles never come singly. Presently I heard my mother come round the garden with the children in tow, and hold a conversation with the man. Then she said, "I am afraid I don't know anything about the gas copper; I will have to see my daughter." So she came looking for me.

Is it when we feel maddest that we say most or least? However, I said: "If you would take the man round to the washhouse and close the front door I might be able to get my clothes on and come and see him." (I might here explain that I had closed the door when I went to the bathroom.) A few minutes later, with my outdoor clothes on, my head held high, and a face like a blooming rose, I went forth to face my awkward moment. That man was as much embarrassed as I. However, I am sure if ever I meet him again, I will feel that my clothes are leaving me, like the petals of a rose on a windy day, and I am standing there in my underwear.—**Gerrie Mac, Dunedin.**

Competitions

SEPTEMBER:

Already there are useful and constructive ideas coming forward in this competition, and I am sure you will all be interested to read the results. Remember what we wanted? Well in case you have forgotten, we want to know your views on who makes the better mother, a younger woman or an older one. And the competition closes on October 15th, so be in time.

OCTOBER:

Hullo there, Garden-lovers! Here is a competition all for you, and I know you are going to love entering for it. It's not difficult—all we want is a short entry telling us what your garden means to you—is it a help or a hindrance, a joy or worry?

"WHAT MY GARDEN MEANS TO ME."

This competition does not close till November 15th, so there is time ahead of you to plan your thoughts. Two prizes: First 10/-, and second 5/-.

"MARY,"
C/o. "Journal of Agriculture,"
P.O. Box 3004, Wellington.

MINE is a really double moment, and distinctly awkward too. One drenching wet Sunday I wore my new gumboots to church, taking shoes with me to change into. But chattering to

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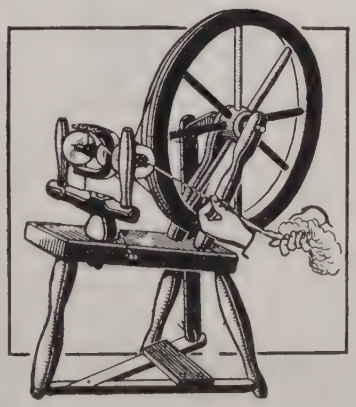

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fellow-members of the choir the minutes slipped away, and eventually the bell sent me hurrying into gown and "mortar-board" only just in time. The choir formed in the porch while the hymn was announced, and then we commenced the dignified procession up the central aisle. Imagine my gasp when I discovered my gumboots still on my feet, although mercifully almost hidden by the gown! Kneeling was a little awkward, but I managed, and had quite forgotten them by the beginning of the sermon. Then my neighbour whispered to me: "I'm sure that radiator near you has fused—there is such a smell of burning rubber!"

Afterwards, of course, I could laugh and explain, but my moment was quite awkward enough while it lasted.—**London Lass, Wellington.**

MY awkward moment goes back to many years ago, when gramophones were the latest vogue. I was visiting a friend to meet some visitors, and I think the record was called "Casey Goes to the Dentist." Anyway, Casey had just reached the part where he said, "Look at the face of that coming through the door" when I made my entry. Imagine my thoughts on hearing a strange voice make such remarks! But we did enjoy the joke.—**J.F., Otara.**

IT happened in the days when dresses were "betwixt and between" and long evening frocks had not returned, so we bedecked ourselves in fish-tailed dresses that reached our knees at the front and our heels at the back, and petticoats were a bit of a problem. I had a most ingenious arrangement of sliding straps which lengthened or shortened the straps as required, but alas, it was my undoing. It happened at National Park in the August holidays, when the place was packed, the visitors including some twenty schoolboys. I was with a party of bright young things, and just at the age (about twenty) when I considered myself very grown-up. I was wearing a green georgette frock brightened by a vivid green slip—with the treacherous straps!—and as I walked out of the dining-room, feeling very dignified with a cigarette in a long holder as was then the fashion, I heard the schoolboys giggling. However, I took no notice until I felt a restriction round my legs—horrors, my straps had unhooked and my slip had slipped! I grasped myself round the middle and scurried from the room, but it was certainly a blow to my young dignity. —**Q.W.E., Coromandel.**

RAINSTER ON ACTIVE SERVICE

If you're a Team Worker, we don't have to tell you what a comfort your Rainster is! Rain proof and cold proof. If you have no Rainster and can't get one (and everybody who does a war job needs a Rainster) it's too bad! But you see, the majority of Rainster House — that modern and efficient home of Rainsters — is all-out making Rainsters for the Navy, W.R.N.S., W.A.A.F.S., Red Cross Transport and other services. Which proves they're good and worth some effort to get . . . but only makes it all the more exasperating that you can't get yours. Well, don't give up — you may be fortunate yet! If not . . you know how it is . . the war must be won.

Mary's at - Home -

WHILE our hearts are gladdened and lightened by the wonderful continued success of our armies, I came across an article recently on this lack of concentration so many complain of these days. I too am one of those who seem to have developed a good "forgettory" these days. I wonder sometimes if my brain is really going "wonky." So I was interested in the following explanation which I found in an English journal. It said: "The trouble is that so many are our interests and so varied, we concentrate on nothing. And concentration comes from caring enough and being passionately interested. When interests are split up our poor memories fail us. Well, we do overwork them, don't we, Mary? I am sure we often forget that we can't go on cramming our brains with so much, for we are only human after all.—**Tiggetty Boo, Kati Kati.**

I WOULD just like to add my little bit about the joys, peace, and pleasure, also the feeling of accomplishment derived from gardening. I do not get out very much owing to having quite a large young family, but I do not complain, as I have my flowers for company. It is so thrilling to watch each variety of flower bloom, and each colour scheme materialise, that I am sure one cannot help but feel sweet-tempered in a garden. Just last week the sheep broke into my garden and played havoc, eating and tramping upon my precious bulbs, etc. Well, I did shed tears of disappointment, but decided not to be put down over it, and made a fresh start. Anyway, nothing is as bad as it seems at first, and I had cause to laugh as I remembered the nice juicy rose and gerbera plants due to arrive in a few days. Now they are duly planted, and the sheep and I each gloat over them—I in the garden, and they outside a decidedly sheep-proof fence. I would rather go stockingless than have to do without my garden.—**Floral Lady, Southland.**

MY magic word on wet days is "Shop." It is so easy to come by the necessary wherewithal—just save all wrappers, tins, containers, in all the glory of their newly bought freshness. Curtain off an available corner for the shop, or if you happen to have an outsize in packing cases, convert that into the family shopping centre. Paper money if available enhances the reality, and the buying and selling at correct current prices is an educational facility not to be overlooked. The children love to be customers, and to take turns at being shopkeeper. I would make it a general store; then the toddler after buying some toy or other will amuse himself playing with it. Likewise a reader prefers a book, a boy some nails and a hammer, etc. Scope is unlimited, as children are great imitators, and find no difficulty in portraying Mr. Shopman, or Mrs. Green ringing up her order, to say nothing of the message boy delivering the order with the customary whistle. Noisy, did you say? Well, maybe, but a healthy noise, and a happy one, and who cares whilst our offspring are happy and paving the way to good citizenship.—**Roundabout, King Country.**

THE war has been responsible for women undertaking many tasks hitherto foreign to them, and I was interested to read the other day of the registration of a woman as a veterinary surgeon. She is Annette Rogers of Rotorua, and I think I am right in saying that she is the first woman to be registered in New Zealand as a veterinary surgeon. Good luck to her in her new venture.—**A. S. C., Carterton.**

OH, the joy of sunshine after rain! It has been a sparkling day, and the whole world seemed gay. As I stood on the hill top hanging clothes on my line, miles from anywhere, you might think "how quiet," but I was struck by the many sounds I could hear. I tried to count the different noises, but the music of the insects and birds so intermingled that one could not define them. Then there was the clear ring of a bushman's axe, the mixed noises of a nearby mill, and the hum of a car—yes, I had to run to see who it was, because not many cars pass our way. But most beautiful of all to me was the ceaseless chatter and happy laughter of the little tots, glad to be out of doors again at last. How often we seem to be too busy to even stop and listen, and yet what an uplifting effect it has when we do make an effort and just take time off to stop, look and listen.

I must tell you about one wet day. I was making butter, but it would not "butt," the bread was ready to go into the oven before the oven was ready for it, the little boys were full of questions which required correct answers, and in the midst of all this confusion, comes a knock at the door. The visitors were a honeymoon couple come to stay for a few days. The road was so bad they couldn't get the car up to the house, so the men folk had to return with spade and slasher and cut bracken to put beneath the tyres. We had to borrow mattress and bedding from a neighbour, and this had to be carried up in the wet, but who cares? We had heaps of fun talking and laughing, and just enjoying each other in front of the open fire. There was only one thing that made me sad—my visitors were here for four days, and not once did they even catch a glimpse of my glorious view. It was raining when they came and raining when they left—who would have a honeymoon in mid-winter?—**Fruffy, Te Awamutu.**

MY husband, three children and myself are living in this rather charming spot at the very end of Tauranga Harbour, on one acre of wonderful soil. We grow vegetables—kumeras, corn, early potatoes, tomatoes, the latter being my special charge. I have had a fondness for outdoor work ever since I was in the Land Army in England during the last war. After that I went to Canada and the States working my way from place to place, chiefly gardening. Finally I spent about six years in California. From there after a wonderful trip home to Scotland by way of Italy, Switzerland and France, I came to New Zealand to meet my fate! Now my chief interests are my family and my garden. —**Bonanay, Kati Kati.**

I DON'T want you to think I've gone to sleep for a hundred years, just because I haven't written for awhile! I'm very much alive, cramming three days' work into one, as usual, and enjoying it—also as usual! Someone said to me, the other day, "Have you walked in the early morning, and picked sweetbriar sprays?" I haven't, but I've picked honeysuckle sprays, on a rainy morning. And the two must be equally lovely fragrances, and equally lovable. I wonder, sometimes, if other city-dwellers know the surprising joys of wayside flowers. The day I

NORTON'S THE EGG PRESERVER THAT NEVER FAILS

took the honeysuckle for my office table, I also found wild forget-me-not and buttercups, "shivery-grass," and even a bit of clover. Another day, by a steep path to a house above the sea, I came on a perfect waterfall of nasturtiums. I put down my parcels and plunged in! What joy the gathering made—orange, apricot, cream, primrose, stripes as gay as any tulips—great long vigorous stems, and their own green leaves—I WAS rich!—**London Lass, Wellington.**

SORRY if my pen-name causes you anguish! It is the name of the Welsh town where I lived, although I wasn't born there. I first saw the light of day in Cardiff. When you come to compare them though, it's not nearly so bad as Ngahauranga or Whakarewarewa is it? It means "big hill" or literally "hill, big." Like the Maoris the adjective follows the noun. Pronounce it "Brin-ma-wer" and you'll be taken for a true Welshman.—**Brynmawr, Wanganui.**

NEXT to cookery, my best work is done in kitchen gadgets. I have some wonderful helps, and without boasting I am sure half of the collection has never been seen in this country. I am not colonial-born, although I have been out here for thirty years from when I was a schoolgirl. My parents were the youngest of very large families, and our clan is now scattered in England, Ireland, and Wales, U.S.A., Canada and Australia, and through our correspondence I have kept up with modern living.—**E.G., Manurewa.**

I HAD to miss the Phobia competition because of ill-health. My own phobia is lifts, and I am quite definite about it too! Even before my illness I loathed that shut-in feeling, and I nearly die now as I hold my breath till let out again! Worse still was the time the lift sank in mid-air, and it seemed hours, although it was only seconds really, before it was righted again. How proud I did feel of my husband when we had to use a lift without an attendant, and he ably lowered us to the ground floor.—**Roundabout, King Country.**

Cure for Insomnia

FIRST of all, sell your city house. This will provide a little mental fag to start the ball rolling. Next buy a small farm, preferably one which takes all your capital, so that for a couple of seasons, at any rate, you will be unable to afford labour, and will have to turn out and lend hubby a hand. At 5 a.m. rise and make early morning tea for self and hubby, who is out already getting the cows in. Until 7 a.m. lend a hand in the shed, baling up, leg-roping, and washing cows. (The stooping and bending this entails is also good for the figure.) 7 a.m. return to the house and prepare breakfast for youngsters. Do housework in between whiles, and give music lessons. Cut lunches and get them off to school. Having emerged from this hullaballoo, prepare breakfast for self and hubby. Nothing elaborate, as he probably won't come in when you expect him anyway. Do only necessary housework. There's nothing like housework to get a housekeeper down. By this time it should be round about 10.30. Take a scythe, get outside, and cut blackberry until midday. Return to house and prepare lunch. After lunch, if you are up to date with your washing, ironing, mending, etc. (more than likely you'll be several weeks behind) get outside and cut some more blackberry, or do some gardening. Prepare hot dinner for 4.30. After dinner stack up dishes, and leave for children to wash, while you repair to cowshed and go through the morning's rigmarole again. After milking, stagger home, put small fry to bed, make supper, and flop into bed. If it were a clothes line you'd sleep just as well.

I've tried it, so can guarantee it!—**Brynmawr, Aramoho.**

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Mary's Mixing Bowl

Marmalade Time

NOW THAT the shops are full of grapefruit again, I am sure you are all thinking it is time you refilled those empty jars with tempting marmalade. Breakfast isn't quite complete to me without a dash of delicious marmalade on my toast, and I am sure there are many who will agree with me too. So I have chosen some marmalade recipes for you this month, and I know they will be invaluable, for they are all tested recipes. First of all, here are some hints that will help your marmalade to be a success.

1. The fruit should be well washed before using.

2. Any pith removed when cutting up the peel should be soaked and cooked with the pips to extract the pectin and may then be removed before the sugar is added.

3. Soaking the peel and fruit overnight is advisable, if convenient, but is not essential, provided longer time is allowed for softening the fruit.

4. The sugar should not be added until the peel is quite soft and the excess water boiled off. After the sugar has been dissolved, the marmalade should be boiled rapidly until setting point is reached.

5 The scum should be removed as soon as possible after setting point has been reached, but the marmalade should be allowed to cool a little in the pan before pouring into warm jars, to prevent the peel from rising.

6. Waxed paper circles should be put on the marmalade while hot, but the covers are usually put on when cold.

SEVILLE ORANGE.

Recipe 1

3 lb. Seville oranges, 6 lb. sugar, 6 pints water, ¼ oz. citric or tartaric acid or juice of 2 lemons.

Scald the oranges, remove the skins and cut these into shreds. Place the shredded peel in a basin, pour over half the water and soak if possible overnight. Cut up the rest of the fruit coarsely and soak with the remaining water and acid in another basin. Next day, simmer the peel for 1½-2 hours until it is tender. Simmer the fruit separately in a closed saucepan for 1½ hours and either strain it through a colander to remove the pips and coarse tissues, or rub the pulp through a hair sieve. Add the strained fruit and sugar to the cooked peel, stir until the sugar is dissolved, and boil rapidly until setting point is reached. Remove the scum, allow the marmalade to cool slightly, and pour into warmed jars. Cover with waxed circles while still hot and tie down when cold. Yield: 10 lb.

Recipe 2:—Thick

6 Seville oranges (about 2 lb.), 2 sweet oranges, 1 lemon, 6 pints water, 6 lb. sugar.

Wash the fruit, cut in half, squeeze out the juice and pips, and slice the peel finely. Put the sliced fruit in a bowl, add the juice and the pips tied in a muslin bag, cover with water, and leave overnight if possible. Next day put the fruit in a preserving pan and cook gently for 2 hours or until the

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5 pints from a 4-oz. packet! Delicious served hot or cold with fruit or steamed puddings.

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peel is quite soft. Remove the bag of pips, add the sugar, stir until this is dissolved, then boil quickly until setting point is reached. Yield: 10 lb.

Recipe 3:—Quick Method

6 Seville oranges or 5 Seville oranges and 1 lemon, 3 pints water, 3 lb. sugar.

Wash the fruit, put it in a saucepan with the water and simmer gently for 2 hours with the lid on the pan. If preferred, put the fruit in a casserole, add boiling water, replace the lid and bake in a slow oven for 4 or 5 hours until the fruit is soft. When sufficiently cool, cut up the fruit, separate the pips at the same time, return these to the water in which the fruit was cooked, and boil for 5 minutes. Put the sliced fruit, the liquid strained free from pips and the sugar in a preserving pan, stir until the sugar is dissolved, and boil rapidly until it will set when tested. Yield: 5 lb.

Recipe 4

8 Seville oranges (about 2¾ lb.), 2 small lemons, 6 lb. sugar, 6 pints water.

Wipe the oranges and lemons, cut in half, remove the juice, and slice the rind thinly; or, to save labour, pass through a marmalade shredding machine, removing the pips before doing so. Add the water and, if time permits, soak for 24 hours in an earthenware basin; this is, however, not essential. Place the contents of the basin in a preserving pan, bring slowly to boiling point, and simmer gently until rather less than half the contents of the pan have boiled away. Add the sugar, stir until dissolved, and boil rapidly until the preserve jells (about 5-15 minutes). Instead of adding the sugar to the hot pulp, the pulp may be left to cool, when the sugar may be added and the marmalade boiled until setting point is reached. The latter method is sometimes more convenient, but it gives a slightly darker marmalade. Cool slightly, pour into warm jars, and cover when cold. Yield: 10 lb.

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JELLY MARMALADE.

Recipe 5

3 lb. Seville oranges, 7 pints water, ½ oz. citric or tartaric acid, or the juice of 3 lemons, 5½ lb. sugar.

Scald the oranges, remove the skins, and cut about 6 oz. into fine shreds. Put them in a basin and cover well with water. Cut up the oranges coarsely and soak these separately with the acid and any remaining pith and peel in the rest of the water overnight. Next day, simmer the peel for about 1½ hours until it is soft, and simmer the fruit separately for about 2 hours. Drain off the liquid from the shreds, add it to the fruit and strain through a jelly bag. Put the strained juice in a preserving pan and simmer for about 10 minutes. Add the sugar, stir until this is dissolved, then boil rapidly until setting point is reached. Skim quickly and add the dried shreds. The jelly in the pan should then weigh 9¼ lb. Skim at once, allow the marmalade to cool slightly, and pour it into warm jars.

LEMON.

6 large lemons, 6 pints water, sugar.

Wash the lemons well. Pare off the yellow rind, removing as little of the white pith as possible, and cut it into shreds. Take off the white pith, cut it into small pieces or pass through a mincing machine, tie the pith with the pips in a piece of muslin, and put it into the pan along with the peeled lemons, which should be cut up into small pieces. Add the water and boil until the contents of the pan are considerably reduced and thick. Remove the muslin, squeezing as tightly as possible. Weigh the contents of the pan and add an equal weight of sugar. Bring to boiling point, boil from 10-20 minutes. Test for jelling, cool slightly, pour into pots. Cover with wax circles and tie down hot or cold.

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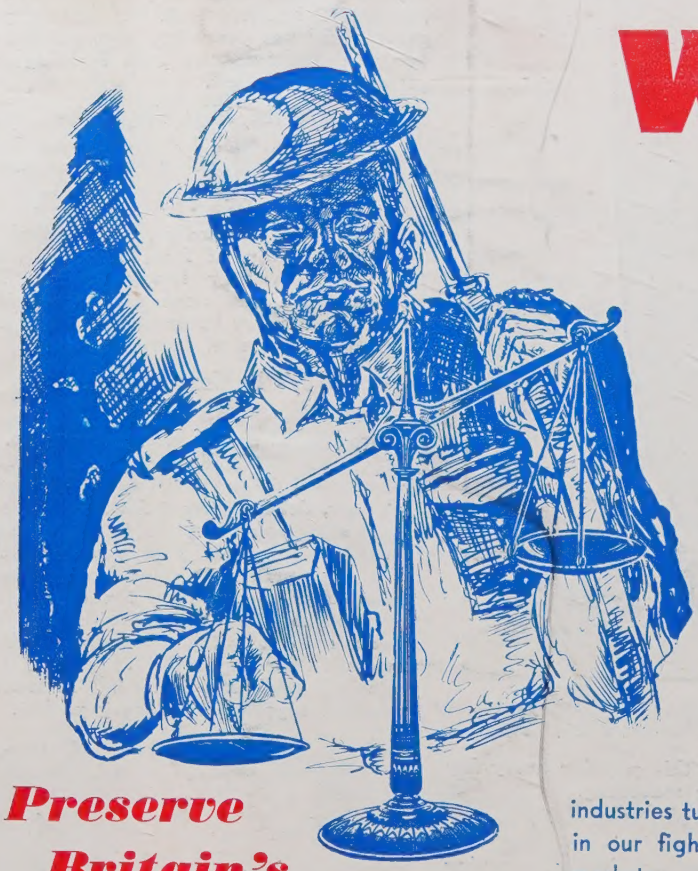

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